

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 54 WALL STREET, NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.
SECOND QUARTO SERIES, VOL. V., No. 33] SATURDAY, AUGUST 18, 1849. [WHOLE No. 695, VOL. XXII.

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PUBLISHED BY J. H. SCHULTZ & CO., 54 WALL ST.

Saturday, August 18, 1849.

Iron Ores and the Iron Manufacture of the United States.

Continued from page 493.

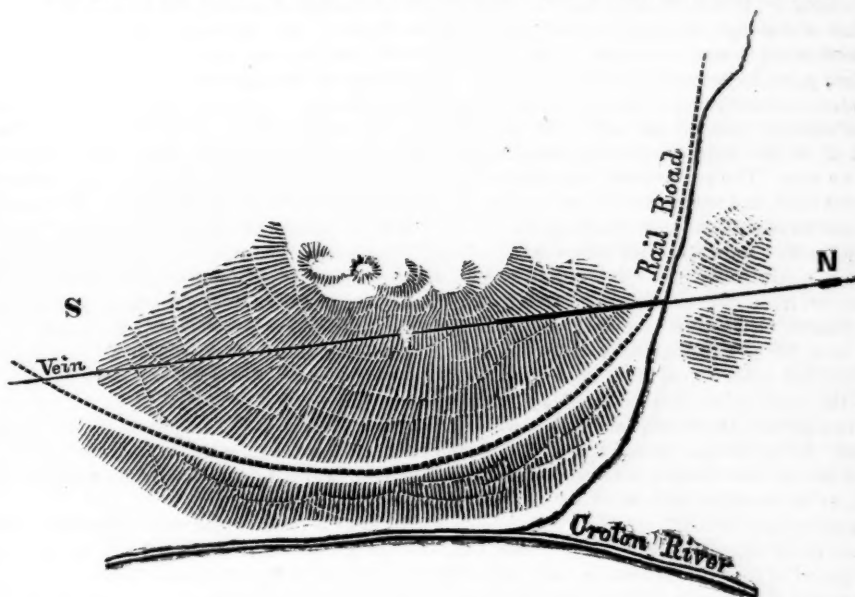
NEW YORK

Magnetic Ores.—Putnam County.—The ores of this county have in years past been used to considerable extent, and will some time again be in demand, when other fuel than charcoal can be cheaply brought to their vicinity, or the ores can be carried to meet the anthracite.

They are magnetic ores, found in that range of primary rocks, which border upon the limestones and slates of the hematite ore range to the east and south. These primary rocks include indeed a part of the hematite formation along the line of the state in Dutchess county; but farther south in Putnam county the stratified rocks, which contain the hematites, have given out, and the granitic rocks cover nearly the whole county, their range extending across the Hudson, where they constitute the Highlands, and thence through Orange county into N. Jersey. Throughout their whole extent they are characterised by large and important veins of magnetic oxide of iron.

The first of these we meet with is in the town of Southeast, on the line of the Harlem railroad.—This vein was once wrought to considerable extent,

Magnetic Ore Vein at Southeast, Putnam County.



the ore being carried great distances to supply forges in the neighboring towns. It is found in the granitic rocks of this region, whose range farther southwest furnishes the ores of Orange county, and of northern New Jersey. The vein is vertical, pursues a north and south course, and has been opened by an excavation of sixty or seventy feet in depth up the north end of a high ridge. The Harlem railroad, curving around the base of this ridge, crosses the line of the vein twice, as represented in the accompanying sketch. To the north of the road, about fifteen rods, the vein has been opened again and a deep pit in the solid rock a hundred feet long and ten wide, now filled with water, shows, together with the workings on the other side, that at one time this ore was in good demand. Floating on a raft in this pit under the arch of the rock into what appears the commencement of an adit, I was able to measure the thickness of the ore in this ten foot cut. It occurs in parallel veins running with the main vein of quartz, the aggregate thickness of the ore veins being from three to four feet. On the ridge the ore is concentrated into a single vein of about the same thickness of three to four feet.— Sometimes next the wall are layers of sulphuret of iron, but the quantity does not appear sufficient to injure the ore. Quartz is more or less mixed with it, and in such proportion as to be of no small service to it as a flux. The coarsely aggregated structure of the ore is evidence that it must be a good working ore either in the blast furnace or forge. Except the small quantity of sulphur I have seen nothing likely to impair its useful qualities.— The length of the vein is not known, but it is proved to extend far enough to supply a very large amount of ore. There is no fuel to smelt this in the vicinity, and the Harlem railroad now offering a cheap mode of transportation to the coast, it will probably be taken there and smelted with anthracite. The ore can be mined for about \$1 25 per ton and the same sum will pay for its transportation. The hematites farther north on the line of the road would be improved by the addition of this ore to the charge in the furnace, and the

magnetic ore too would work better for a mixture of hematite.

This vein in the New York State Geological Reports is called the *Townsend Mine* on the Simewog Hill. Prof. Mather's account of the Mine is much more flattering than what I have given. He says: "This mine was the first known and first worked in this part of the country. The ore was carted to great distances, and shipped on the North River to some of the towns on Long Island Sound and various parts of the country. The largest portion of the ore was carried to Danbury, in Connecticut, and was there an article of traffic. It has not been wrought for twenty or thirty years in consequence of other beds having been found in more convenient locations for smelting and transport. Fifty thousand tons of ore at least have been taken from this mine, estimating four tons to the cubic yard, and 100,000 tons more may probably be taken from the vein in Simewog Hill, without going below the level of the small stream which flows across the ore bed. Should it ever be necessary to obtain this ore in quantity at least 1,000,000 tons may be calculated on above the water level of the Croton River, which flows along the base of the Hill, and free from the expense of drainage, by driving an adit level from the level of the Croton, a distance of three or four hundred yards, to intersect the vein.

This vein of ore has also been worked to the extent of several thousand tons near the road and north of the little stream mentioned above as crossing the vein. The vein here is from eight to fourteen feet thick, and nearly vertical in position, between strata of gneiss and hornblende gneiss, which dip 70° to 85° to the ESE. On Simewog Hill, one-fourth of a mile south, the vein is from three to twenty feet thick, associated with similar rocks and with granite. It has been wrought on Simewog Hill from 50 to 60 feet or more in depth over a length of 340 to 400 yards. It is scarcely doubted from the observations made, that this vein is at least two miles in length with an average width of six feet. Its depth cannot be estimated, but it is presumed that the labor of ages could not exhaust it in depth, as the bottom of such veins have never, in any country, been found."

More in the centre of Putnam county, away from any means of cheap transportation, are mines of great extent, easy to work and furnishing good qualities of magnetic ores. But the wood in their vicinity being long ago consumed, there is now no demand for these ores, and the mines remain neglected. They seem to lie on one range, perhaps one great vein, which is traced in a NNE. and SSW. direction along the crest of the highlands, back of Cold Spring and Peekskill for an extent of about eight miles. It approaches within nine miles of the river at Cold Spring, where much of the ore has been brought in former years and smelted in the old stack now standing on the top of the hill above the river. It was estimated to cost three dollars per ton, delivered on the river, which cost might be somewhat reduced by a more systematic course of mining than was there pursued. The veins are described as of great width, sometimes containing twenty-five feet of solid ore. Some of it of excellent quality of granular ore, and some of it titaniferous. From the vast amount of these ores and their convenient position for mining, high above the water courses, it is probably they will ere long be as extensively worked, as they have been heretofore.

The principal mines are known as the *Phillip's Mine*, the *Stuart Mine*, the *Denny Mine*, *Coalgrove*, *Gouverneur* and *Kemble Mines*. According to the

account of Prof. Mather it would seem that these mines have already supplied some 50,000 tons of ore.

Orange County.—On the east side of the Hudson the mines of magnetic iron ore appear to be inexhaustible, so on the west side among the Highlands, their number and extent are almost without limit;—and so they are at this time almost equally neglected, for at this moment there are only two furnaces using them, the old *Southfield Furnace*, belonging to Peter Townsend, Esq., and the *Greenwood Furnace* to Mr Parrott. Another it is true is just built by P. Townsend, Jr., which will be set in operation when iron bears a higher price than it did in 1848.

It is remarkable that these mines, so abundant back from the Hudson on both sides, should be wanting in the hills overlooking the river; or it not wanting, that the ores should here prove wholly worthless, either from their small quantity or inferior quality. No where would ores be more valuable than in this position, and no where can a locality be found that seems so likely a place to afford them, and yet contains none. Proximity to the great market of New York city, and to the termination of the Hudson and Delaware Canal at Roundout, where great supplies of anthracite from the northern coal fields of Pennsylvania can be obtained at the cheapest rates, would render a location on the Hudson near to good mines, of very great value. Here too there would be a choice of fuel, not always enjoyed even at the furnaces near the coal mines of Pennsylvania: for the anthracite of the southern coal fields, brought round by sea, is delivered on the Hudson within half a dollar per ton of the same price with that brought through the canal to Roundout; and sometimes it is advantageous to use one of them in preference to the other, or to mix them to neutralize their impurities or modify the effect of those of the ores. The price of anthracite at this time (winter 1848) at Roundout, is for the large quantity \$3 67 per ton. Brought to the city of N. York it is worth half a dollar more for the transportation, which brings it to the price of the coal shipped from Philadelphia.

But none of the magnetic ore mines are so situated that their ores can be conveniently put upon the river. In the disposition of the mineral resources of the country Nature proves to be remarkably impartial. Few localities possess any great advantages over the rest. If the ores in one district are very abundant and good, either the locality is remote, making the transportation a heavy item, or fuel is disproportionately high; and often where the materials are all cheap, the ores make only a poor cheap iron; and when they are high, the iron sometimes possesses some peculiar character for toughness or suitability for particular uses, that makes it in demand at the highest prices and the works are sustained. By carefully comparing the resources of different localities, one will be surprised to find how uniform are their capabilities; and not unfrequently the apparent advantages of one over another will be found to arise from a greater skill there applied, which alone makes the difference. Thus none of these districts, even in regions originally the most inaccessible, long continue neglected; and in some, where the only fuel Nature appears to have provided has been consumed, and the wild lands brought under cultivation, the art of man opens a way for other inexhaustible stores, which no one ever supposed were intended for such a use.

The river hills have been carefully explored; and some ores have been found; but none of which have

yet proved valuable. At Anthony's Nose below West Point the excavations for the tunnel on the Hudson river railroad opened a bed of ore of a few feet thickness, which, like other ore found on the same mountain, proved too sulphurous to be of any value. On the other side, back of "Caldwell's," mines have been opened, and there are beside many indications of ore within two miles of the river, all of which, so far as I have seen, prove of no account.

Bradley's mine, six miles above Haverstraw, and two back from the river, is of very inviting appearance from the abundance of the ore and the facility with which it may be procured. The mine is opened at the top of a high peak, down which the ore can be slid several hundred feet. Large quantities of it have been taken out and thrown down the hill, and the vein is now well exposed, showing a thickness of full ten feet of ore dipping steeply into the hill. Of this there are two varieties: one a very black unmagnetic ore of granular structure, crumbling on exposure to grains and crystals of oxide of iron;—the other of laminated structure of brown and black ore with some quartz intermixed. Tho' these appear like ores of a fair percentage, they were found by the analysis made for me of A. A. Hayes, Esq. to be rather garnet rock than iron ores. The former consisted of—

Quartz and silica.....	38 70
Lime.....	21 25
Magnesia.....	3 10
Alumina.....	11 06
Per oxide Manganese.....	0 93
Per oxide Iron.....	24 73
	99 77

The latter of—

Quartz and silica.....	41 33
Lime.....	22 00
Alumina.....	6 43
Per oxide Iron.....	29 00
Oxide Manganese, }	traces.
Oxide Titanium, }	
Magnesia, }	
	98 76

Oxide of tin also was detected in very small quantity in each of these. Mr. Hayes informs me he has before discovered it in the ores of the Highlands; and I have myself found it in a garnet rock of the Andover ore bed in New Jersey, which is in the continuation of this geological formation.

As this locality has from the deceptive appearance of the ores heretofore led to fruitless expenditures in endeavors to work them, and might involve others again, it seemed well to join this account of their character, though they can be of little real value. Should, however, rich ores be discovered in their vicinity, these may serve a good purpose as a flux, for which they are well adapted. Other ores of little better character I have found in the same vicinity. In the abundance of these there is certainly encouragement that beds of richer ores may some time be found.

Omitting many veins of inferior promise found between this place and West Point, the most important mine with which I am acquainted between the summit of the Dunderberg Mountains and the Hudson river is the *Forest of Dean Mine*, about six miles back from Fort Montgomery to the WNW.

This mine was extensively worked some years ago, and the ore was smelted at a furnace situated three miles towards the river on Pokalo Creek.—Since it was abandoned it has filled with water, so

that no accurate knowledge can be obtained of its extent. That the vein is a large one is evident from the width of the opening, and that it has been worked to considerable depth is also apparent from the depth of the water and the heaps of rubbish about the mine. From the most authentic statements I could get, I judged that from ten to sixteen feet of ore might be relied upon in a regular vein cutting through the knoll where the old mine is situated, and it is by no means improbable the vein may be much larger. Its course is east of north and west of south, the vein dipping with the strata of gneiss in which it lies at a steep angle to the east. A stream of water runs near the mine and has been diverted to flow over the bank, that it might afford power to pump the mine. It is of no small consequence for this purpose, as, from the situation of the mine, it could not be drained by an adit more than about 20 or 25 feet. The ore has been in high repute, and formerly sold at prices far greater than any ore now brings. The specimens lying about the mine are of good quality of magnetic ore evidently quite rich and apparently free from injurious ingredients. Of rather compact structure, it is likely to be much harder to work than the coarse granular ores of some of the mines of Lake Champlain. It is in a district of several thousand acres of good woodland; and if the ores could be obtained at a reasonable rate, a charcoal furnace might be run advantageously within two miles of the river;—or still better, the ores could be taken to the river and there smelted with anthracite. It is an easy down grade to the river with a good gravel road following the course of the Pokalo Creek. Having been employed by different parties to investigate the resources of this locality, I have made the following estimates of the cost of making charcoal and anthracite iron—reckoning the *duty* or *ore-leave* at 44 cents per tons.

For Charcoal Iron two miles from the River.

Ore, 1½ tons, mining \$1 25	
Duty.....44\$3 83
Trans.....50	
Charcoal, 160 bush. at 7½ cts.....	12 00
Labor 2 50, flux 50.....	3 00
Repairs, Superintendence, Interest etc	3 00
	\$21 83

To which add 37 cents for transportation to the river.

Anthracite Iron on the River.

Mining.....	
Ore, 1½ tons duty.....	\$4 27
Transportation.....	
Anthracite, 1½ tons at 4 37.....	7 66
Other items.....	6 00
	\$17 93

To put this iron in New York market would cost fifty cents more, making the whole cost of the anthracite iron only \$18 50, a less price than any iron it is believed can now be furnished for. These resources would have been made use of before this had the property been so situated that the ores could have been obtained.

A few miles west of this locality is the summit of the Dunderberg Mountain, which, with its continuation under other names north and south, divides the valley of the Hudson from the valley of the Ramapo. It is in this valley that the great ore beds of Southern New York are found—beds equalling in extent perhaps any of the other immense deposits described in this work as occurring in New Hampshire, Northern New York, Missouri or Georgia. And yet though these ores are so abun-

dant that for centuries they might supply the world with iron, not so much use has been made of them at any one time as of a single hematite ore bed in Massachusetts or Connecticut or Pennsylvania. They were discovered at an early period in the last century, when the territory was owned by Lord Stirling. Furnaces for smelting the ores were established as early as the year 1750, and from that time to the present a few thousand tons of ore a year have been used. But though the whole amount may be 200,000 or 250,000 tons it is as nothing compared with the vast bodies of ore lying exposed to view on the surface.

Although numerous furnaces and forges at a former time made use of these ores, yet as charcoal became scarce they gradually ceased their operations, till for some years past the Smithfield and the Greenwood Furnaces alone kept in blast.—These mines are described in the Geological Reports of Professors Beck and Mather. I shall content myself with referring to these reports for descriptions of particular mines, limiting myself to a general account of their resources, and of the furnace operations.

Copper Ores of Lake Superior.

Continued from page 498.

The range of hills on Keewena Point, south of that which contains the mines hitherto described, is of a porphyritic trap rock, and its metallic veins consist of ores in place of native metals. The resemblance both of the veins and of their repository (the porphyritic rock) to those of the better known mining districts of Central Europe and of Central and South America is as marked as the difference of the veins of the trap range from all other metalliciferous deposits is striking. And as the porphyritic character of the rocks containing metallic veins is elsewhere regarded as highly favorable, its development here cannot but be considered in the same light, although the veins have not yet been proved at those depths, where similar veins in other parts of the world are almost alone found productive.

The most promising locality at present known in this range is at *Lac la Belle*, in the steep hills bordering the lake of this name, which lies only four or five miles from the southern shore of the Point.—Near the summit of these hills, and not less than 600 feet above the lake, veins of vitreous copper ore associated with the yellow sulphuret were opened in 1846, which, along the surface, presented a promising appearance, swelling out to a thickness occasionally of several inches of pure ore. Shafts were sunk upon these, without, however, reaching any very productive spots. Still, however, it was judged expedient to commence an adit level near the base of the hill, which should reach the vein at a sufficient depth to fully determine its character.—This level has now been driven in through solid rock a distance of about 700 feet, and it must be near the vein, if it has not already reached it. The result is properly regarded as very problematical, though there are many circumstances tending to warrant strong hopes of success. Of these are the rich character of the ores at the surface, the permanent nature of the vein, and the favorable variety of rock in which it occurs. On the other hand is the uncertainty as to quantity, and the possibility (by no means extreme) that the vitreous and grey copper ores of the lode near the surface may all turn to yellow sulphurets in the deep workings. I have not personally examined this mine the present season, and only speak from my recollection of what I saw in 1846, and from such accounts as I collected this year when in the country.

Another mine of vitreous copper and grey sulphuret of copper was worked in 1816-7 on the continuation of this range back of the Eagle river works, about ten miles from the mouth of this stream. The location belonged to the *Suffolk Mining Company* of Massachusetts; and was for a time regarded as highly promising from the great abundance of the ore. But though the quantity was large the quality was too poor to warrant the continuation of the enterprise, which was abandoned before the vein was proved at any great depth. I have not visited the locality and cannot speak with knowledge of its character.

From this vicinity to the waters of the Fire Steel river and the Ontonagon, no other mines are at present wrought to my knowledge except that of the *Quincy Company* on the shore of Portage Lake.—Of this I have no information except the report that they are raising some metallic copper. I am in hopes, however, to have before long some reliable account of the mine, which I may present to the readers of the Journal.

H.

D. K. MINOR, ESQ.

The numerous friends of Mr. MINOR will be happy to hear from him through the subjoined communication which he enclosed to us on board the steamer *California*, on the eve of her leaving for San Francisco. He was then in fine health and spirits. He promises to give us some of the results of his California experience, which we shall be happy to place before our readers.

For the American Railroad Journal.

Joshua Forman,

FORMERLY OF NEW YORK.

I owe an apology, Messrs. Editors, not only to the writer of the following notice, but also to you, for having so long kept in my possession a just tribute to the subject of this notice. My only excuse is that I desired to add my own testimony to that of the writer, a gentleman of high respectability residing in Philadelphia, in favor of Joshua Forman, whom I have known personally—though not intimately—for nearly forty years. As a man, he was intelligent, active, persevering and liberal; as a Judge he was ready, prompt and impartial; and as a statesman, though little before the public as such sagacious, and in advance of the age in which he acted—so far, indeed, was he in advance of the people of 1806-8, -10 and 1812, in the western settled portion of New York, that he was called “a visionary”—yet his wildest predictions in relation to the Erie Canal, the rapid advancement of the western country, importance of the village of Syracuse, now a city, have been more than realized; yet, like most other pioneers in great enterprises, he never participated in the improvements and advantages foreseen by him; nor has he ever received his just share of credit and honor for the services he rendered;—may I, therefore, ask of you the favor to publish the following tribute from one who knew him intimately and long—with this feeble effort.

Yours, very respectfully,

D. K. MINOR.

Panama, New Grenada, June 20th, 1849.

To the Editor of the American Railroad Journal:

JOSHUA FORMAN.

It has often been a matter of regret and surprise to us that, in connection with the great “Erie Canal,” the name of JOSHUA FORMAN never, or very seldom, appears.

It is not our purpose to take away from the glori-

ous halo which surrounds the names of Gouverneur Morris and DeWitt Clinton, one bright ray; but whilst we accord all honor to those great benefactors of their common country, we claim some tribute for gratitude for Joshua Forman.

It is not pretended that the last-named gentleman originated the idea of connecting the waters of the Hudson with those of Lake Erie. Morris, Ellicott, Clinton and others saw the importance of such a work, at an early day, but we claim for Joshua Forman, formerly of Onondaga, the honor of first bringing the project before the Legislature of his native State, New York, and of pushing its advancement so long as he continued a member of that Legislature. He and the late Judge Wright, of the same state and Legislature, were room-mates at Albany, and gave much of their time and attention to this great plan. If we mistake not, so early as the year 1807 Judge Forman introduced the first "resolution" on the subject; the enterprise, at first, found few friends; its projectors were in advance of their age, and but a few hundred dollar were appropriated for an exploration of the route. At a succeeding session a larger sum was granted, and the subject was attracting friends, when Forman left the Legislative Halls for the Bench, having been appointed first Judge of Onondaga County.—Clinton then took up the matter, and his herculean mind only grasped the difficulties of the undertaking to conquer them, and build for himself an undying fame.

We have often asked ourselves the question—How, when the trumped of fame was sounding its spirit stirring notes in honor of Clinton, one glad note was not vouchsafed to *Foreman, the Pioneer*?

We knew the subject of our notice well. More than thirty years we listened, with pleasure, and we hope with profit, to the emanations of his clear head and bright mind. We heard him detail his struggles for the "Canal," how he wrestled with prejudice, how he confirmed the wavering and how he convinced the doubting.

Judge Forman projected and laid out the city of Syracuse; but long since he left the place of his adaption to seek new enterprises in the south, his energetic mind leading him to new projects and encountering new difficulties.

Smooth be the end of thy path, my old friend; and as you sink into the vale of years may thy spirit be comforted by the reflection that you have always been a true friend to your native state, and given your best years to its improvement, and the welfare of its people. The Destroyer of the Ephesian Temple lives in history—its founder is without a name. Such is fame!

G. C. McC.

Philadelphia, 12th Feb. 1849.

Georgia

Efforts are now making in this state to construct a railroad from the Central road to Augusta via Waynesboro' in Burke county. The length of the proposed road is 52 miles, and its estimated cost \$500,000. To raise this sum it is proposed that the city of Savannah shall subscribe \$200,000; and \$100,000 more to be raised by a subscription of its citizens. It is believed that the Central road would subscribe \$50,000 leaving only \$150,000 to be raised in Burke county and elsewhere.

A large and enthusiastic meeting was held by the citizens of Savannah on the 7th instant to take into consideration the expediency of extending aid to this object, the proceedings of which we give below:

RAILROAD MEETING.

Pursuant to a call of the Mayor, a public meeting of the citizens of Savannah was held at the Long Room of the Exchange, August 7th, 1849, at 12 o'clock M., for the purpose of considering the propriety of extending public aid to the construction of a railroad from the Central road to Augusta.

On motion of Major A. Porter, his Honor Dr. Richard Wayne, Mayor of the City, was called to the chair, and Edward J. Harden appointed Secretary.

The Secretary read the request of citizens and call of the Mayor for the meeting, whereupon Major Porter opened the meeting by some practical remarks upon the importance of the proposed connection of Augusta and Savannah by railroad from some point on the Central road to Augusta. He was followed by F. S. Bartow, Esq., in a strain of earnest eloquence.

Joseph S. Fay, Esq., then offered the following resolutions, which were seconded by A. Minis, Esq.:

Resolved, That the City Council of Savannah is hereby respectfully requested and authorized to subscribe to the Burke county railroad to the extent of \$200,000 if needful, to ensure its completion.

Resolved, That a committee of twenty-five persons be appointed by the Chair to district the city and canvass it thoroughly for subscriptions to the proposed road.

Resolved, That that committee report at an adjourned meeting to be held at this place on the 14th inst., at noon.

The resolutions were advocated by A. R. Lawton, A. Minis, R. R. Cuyler, John Stoddard, F. A. Tupper, and Edward J. Harden, Esqrs., and were unanimously adopted.

Mr. Cuyler offered the following resolutions which were also unanimously adopted:

Resolved, That a committee of Ten be appointed by the Chair to attend the railroad meeting to be held in the county of Burke in the month of September next, to confer with the people of Burke on the subject of carrying through the Waynesboro road.

Resolved, That we respectfully recommend that the Waynesboro company be forthwith regularly organized, it being our conviction that the Road can now be built.

The following committee of Ten were appointed by the Chair as delegates to said meeting:

R. R. Cuyler, F. S. Bartow, A. R. Lawton, A. Minis, W. P. White, J. W. Anderson, C. A. L. Lamar, J. L. Swinney, John Boston, H. K. Burroughs.

On motion of Mr. Cuyler, the Mayor was added to the committee of Ten.

It was proposed by Capt. John W. Anderson that the persons present be invited to subscribe, when it was ascertained that the sum of \$46,000 was made up.

The meeting then adjourned to meet again on the 14th inst.

From the feeling manifested in Savannah, we have no doubt but the amount to be furnished by this city can be relied upon. The Central railroad we presume will subscribe at least the amount it is called upon to furnish. So we see no obstacle to the construction of this road with as much despatch as is compatible with a work of this nature.

The above is undoubtedly a very important road for Savannah. It will give her an equal chance with Charleston for the trade of Augusta and the contiguous country, leaving it a prize to be ultimately carried off by the town possessing the superiority of natural advantages and in the energy and business character of its citizens.

On Gold, and Gold Mines.

BY WILLIAM BYRKNYRE.

No. 11.—Gold Diggings, or Washings, and Gold Mines.

Continued from page 506.

But, to return to the subject matter, the gold of Scotland was found chiefly around the lead hills in Lanarkshire. Some of it was found here in the gravel beneath the moss, and much of it in rivulets, where pieces were picked up weighing upwards of $\frac{1}{2}$ lb. A piece in the crude state weighed 2 lbs. 3 ozs. troy. Occasionally a little of the metal is picked up to this day. A piece of gold, weighed 1.2oz., was recently found in Sutherlandshire. The discovery of gold in Ireland is but of a recent date. Previous to 1796 very little appears to have been obtained, but in the autumn of that year "a man crossing a brook found a piece weighing about 1.2 oz." It occurred in the Ballin Valley stream of the County Wicklow, near to the Croghan Kinshala Mountain. Government collected 78 1.3 lbs., which produced £3675. The gold, on the average, contained 9.8 per cent. of alloy, which was chiefly silver. The peasantry, on their own account, are supposed to have collected about £6000 worth. The metal here, as elsewhere, was obtained in from the most minute particles to lumps which weighed 7 ozs., 9 ozs., 18 ozs., and even 22 ozs. All attempts under the Government officers to find the lode were unsuccessful.

From what I have before stated, it is unnecessary to name all the substances in which gold is found. It will suffice merely to mention that it is obtained in large quantities in quartz, granite, gneiss, mica slate, clay slate limestone, magnesian limestone, and in alluvial deposits of manganesic oxid of iron, ferruginous sands and clays. Nothing more need be said of the directions of the lodes, or veins, in which it is found, than that it is obtained in every possible direction, and in a vast variety of positions.

In respect to collecting the gold from gold sands, the simplest mode unquestionably is that which has endured for thousands of years in Africa. On the west coast of that continent, for instance, the negroes after harvest begin to wash the sands, and a brown colored clay, in the dried shell of the gourd (calabash). Some care is requisite to prevent the gold being washed away, as it is often in a minute state of division. This operation, therefore, is consigned to the women. Where the inhabitants think there are greater deposits they dig pits for the metal; but a hoe and a spade, and two or three calabashes, are all that the negroes use. With common diligence much gold is collected; a person often having it in his power to collect £15 worth of gold in a season, even by the above crude apparatus.

The greater part of the gold of the ancients was obtained by washing alluvial soils in pretty much the same way as it is practised in the present day. And it is most likely that a portion of their gold was extracted, as it is just now, by the aid of mercury, as they were well acquainted with the properties of

this metal. No positive information, however, has come down to us that they used mercury in this way, but the above inference accords with what Pliny says on the subject of purifying gold by mercury, and is confirmed by the fact, that mercury was employed in the European gold mines when gold and silver existed in visible metallic particles, long before the application of mercury in Peru in 1516, where it was first used for the extraction of silver mineralised by sulphur, chlorine, or bromine; and it is further strengthened by Jameson's *Report on the Geology of the Punjab, &c.* (vide *Asiatic Journal* for 1843), where, in that little known and lately conquered territory, the gold washers use mercury to collect the precious metal, after which they submit both to heat, when the mercury is volatilized; which method may have continued as far back as the days of Alexander the Great.

Gold is now obtained with great skill in the north of Piedmont, near Monta Rosa. It is here raised from mines in the mountainous region which separates Piedmont from Switzerland.

The metal in that district is found in a mixture of iron pyrites, blenda, and galena. The workings are carried on by following the vein, which is not so hard as the gneiss which incloses it. When the ore is brought to the furnace, it is first broken and picked, and afterwards crushed smaller by a pair of stones, then amalgamated in mills of a simple and peculiar construction—the barrel system of amalgamation not having succeeded in this district. The loss of mercury is but one-quarter of the quantity employed, which is a little less than one per cent. of the crushed ore. The gold in the rough ore varies from 1 lb. in 2000 lbs. to 1 lb. in 100,000 lbs. This quantity, and the trifling expense of about £14 for a pair of stones, and four amalgamation mills, with other necessary apparatus, has been sufficient to keep the workings in activity for centuries. These mines are conducted by private individuals, who, by their enterprise, probably contribute annually 600 lbs. troy of gold to supply the wants of man. The profit to a proprietor occasionally amount to £1100 per annum.

In Transylvania, gold is obtained in streams, or alluvial soil, also from ancient mines. The gypsies, who are numerous in that country, occupy themselves mostly in picking up the precious metal in streams, for which the Austrian Government exacts from every one so employed at least 19s. 6d. per annum. The most celebrated are near Zala-than, in the basin of the river Maros. A mine in this locality, called the Maria of Loretto, yields auriferous pyrites, which sometimes contains 28 lbs. of gold per cwt. of the ore. Some of the galena (sulphuret of lead) of the same place, contains about 1 oz. of gold, with 30 ozs. of silver, in a ton of ore; but the gold here is chiefly found in iron pyrites, abounds in decomposed porphyry. The metal is separated from the matrix by two methods. The first, and that which has been practised from time immemorial, consists merely in pounding the ore, and then wash-

ing it on inclined tables, covered with canvas—the fibres of the canvas detaining a considerable portion of the gold; while the earthly matter, and the greater part of the other metallic substances in the ore, are carried off by the water. This plan is similar to that practiced long ago by the aborigines of Peru, with the difference merely that they used the skins of the lama and the vicuna. The Brazilians have, for more than a century, used the skin of the buffalo this way; and the plan still obtains in at least one of the three English companies who work gold mines in Brazil; yet, though still in use, it is admitted that as much as 33 per cent. of the gold is lost.

The metal after being washed, as described, is usually collected into a wooden bowl, and then amalgamated in a mortar, and the mercury distilled, leaving the gold behind. In some of the valleys, it is customary for each family to have a trough and a washing table. The men raise the ore, while the woman break it, and attend to the washing of the schlich-pounded ore; and, where the ores are rich, the inclined tables are preferred to the amalgamation mills. In some establishments the ores are amalgamated in Tyrolian mills, and are found profitable when they contain 1 of gold in 533,900 of the rough ore—mercury being allowed to the extent of 1 in 7455. Most of the mines are conducted by Government; but some are carried on by private individuals, who pay 10 per cent. of the produce to the State.

According to Becker, in his *Handel's Lexicon*, the average annual produce of the gold mines of Transylvania for the last five years ending with 1834, was equal to 2140 lbs. 2 ozs. troy, and those of Hungary in the same period 1615 lbs. 10 ozs., and the other portions of the Austrian Empire yielded 105 lbs. 11 ozs., raised chiefly in Upper Austria and the Tyrol, the total quantity being 3861 lbs. 11 ozs. troy. The most recent intelligence regarding the mines of Transylvania and Hungary appeared in the *Anales des Mines* for 1845, tome vii.; M. Audibert, the writer of the memoir, states at page 96, that Transylvania produced gold in 1844 equal to 1880 lbs. 7 ozs. troy, and Hungary, 977 lbs. 8 ozs.—total, 2868 lbs. 3 ozs. troy, of which Lower Hungary, yielded 376 lbs. 1 oz.; Upper Hungary, 75 lbs. 2 ozs.; Nagy Banva, 452 lbs. 3 ozs.; Banat, 75 lbs. 2 ozs.—977 lbs. 8 ozs. The quantity of silver raised in the same period was 51,153 lbs. 5 ozs. troy. In this year the value of the gold obtained was less than that of the silver, but generally the former predominates. Although the mines of Transylvania and Hungary have been so celebrated for ages, they are quiet eclipsed so far as value is concerned, by the mines of Russia, Brazil, and of the United States, since one mine alone, the Gango Soco, belonging to the Imperial Brazilian Mining Association, produced in 1829) and within four years of the workings being undertaken by that company) 4190 lbs. of gold; and now the mines of Transylvania are surpassed by the increasing produce of the mines belonging to the St John d'el Ray company, they having

produced in the 12 months, ending with February of this year, gold to the amount of 2213 lbs. troy.—*Mining Journal*.

Mineral Cements.*

Roman Cement.—It is a remarkable fact, in the history of hydraulic mortars, which originates, as we have seen, with the Puzzolana and Trass† employed by the Romans, that the more the knowledge of their uses has been spread, the more substances have been discovered, which either act as hydraulic mortars themselves, or can be mixed as cements in the preparation of artificial mortar; so that what appeared originally a privilege accorded to a few favored spots only, can now be obtained almost everywhere. A strong inducement to study the nature and modes of occurrence of hydraulic lime, was created by the patent granted to Parker and Wyatt, in London, in the year 1796 for what they termed "*Roman Cement*." The materials employed in the manufacture of this cement, are the nodules, of an ovoidal or globular form, which are found in the London clay, and known by the name of Septaria.—They are not confined to the banks of the Thames, but are also found on the isle of Sheppey and Wight, as well as on the coasts of Kent, Yorkshire and Somersetshire. The composition of these nodules has already been given. They are calcined in perpetual limekilns with coal, in which a very moderate and well regulated heat is carefully preserved. After calcination, the stones are ground under heavy edge-stones, to a very fine powder, which is sifted and then packed in casks for sale.

In the year X of the French Republic, Lesage pointed out the existence of similar cement stones on the coast of France, near Boulogne, and Drapier proved their identity with the English, by chemical analysis.

Roman cement is one of the most powerful hydraulic mortars, and is exceedingly valuable, not only on account of the rapidity with which it hardens, and this is effected in a very few minutes, but because when hardened in considerable masses, it is not liable to crack.

Since that time, similar calcareous marls have been found in numerous places, wherever pains have been taken to look for them, and have been used for similar purposes. To give an instance of this, Kittle in Aschaffenburg, examined a series of limestone from the Spessart, and found in four different places in the neighbourhood, limestone, which yielded a very tolerable mortar, and two varieties of which were excellent. Hydraulic lime has occasionally been met with in the same quarry as fat lime; and its nature not having been investigated, has been neglected as useless in consequence of the slowness with which it is slaked.

All artificial or natural hydraulic limestone are soluble (before as well as after calcination) in muriatic acid, with the separation of silica, except when sand or some similar substance has been added to them.

* From the second volume of Johnson's edition of Knapp's *Chemical Technology*.

† Puzzolana and Trass, are porous volcanic, or pumice stones.—Eds. Cultivator.

Practical Remarks.—The hydraulic lime stones, when they do not contain a sufficient quantity of lime to be capable of slaking with water, must be very finely pulverised; it is only by this high state of division that a proper action can ensue. A thorough penetration of the siliceous portion by the lime is never entirely effected, but a certain proportion remains enclosed and removed from the sphere of action.

One point, which is very often neglected in preparing artificial hydraulic mortar, is the attention to the proper proportion between the slaked lime and cement. Both the ingredients must be mixed by measure or weight, and not merely estimated by the eye.

The best plan is to moisten the necessary quantity of cement first, and then mix the freshly slaked lime with it. The more uniformly and intimately both are mixed, the better is the result.

The hydraulic mortar employed in building the Eddystone lighthouse, was mixed by Smeaton from equal proportions of lime, slaked to powder, and Puzzolana. Trass and Puzzolana are generally mixed with half their weight of lime, as was the practice amongst the Romans. It is desirable to ascertain the best proportions by experiment in all cases where no certain knowledge of the nature of the two substances can be obtained.

Good hydraulic mortar whether made from natural limestone or composed of lime and cement, should not show any tendency to crack when hardened under water, even when no sand is mixed with it. It then forms a very dense and solid mass, which in a short time, neither suffers water to permeate it, nor is attacked by the water, but acquires a considerable degree of hardness. For this reason, it is well to use nothing but hydraulic mortar for those parts of walls which are constantly under water. If the mortar is not only required to harden, but also to bind well, a very important point must never be neglected, and that is to moisten the surfaces of the stones to which the mortar is to be applied. When this is not done, the surface of the stone (by its power of absorbing moisture,) dries the mortar and prevents proper adhesion from taking place. The joint then remains open to a greater or less extent.

It does not by any means follow, that because hydraulic mortar is the only durable material for building under water, it cannot consequently be used for dry walls. It is on the contrary, of the greatest service wherever protection is required against the infiltration of moisture and damp; and dwellings or buildings can often be rendered very much less damp by a judicious application of a hydraulic coating, a layer of this kind, when once hardened, is not calculated, like ordinary mortar, to attract moisture and allow it to pass through. The hydraulic mortar must, of course, when used for covering dry walls or otherwise, be kept moist and watered, until it has acquired its proper degree of hardness. If this is not attended to, a soft, friable, useless coating is the certain result. If moisture

enters from below, for instance, between the wall and the coating of mortar, it will continue confined there in consequence of the impenetrability of the latter, which, on the occurrence of a frost, will most certainly peel off and be destroyed. Care must also be taken that the mortar does not dry up of itself immediately in the air, in which case it contracts and cracks. It is, therefore, necessary to add sand or some other substance which obviates the shrinking. Hydraulic mortar will bear a very considerable quantity of sand without injury to its hardness; even as much as one and a-half times its own weight and more. This addition therefore, is important in an economical point of view. The grain of the sand employed, however, requires attention, as was the case with ordinary mortar; sharp, angular sand is decidedly preferable to blunt, rounded sand, and it is better to use a mixture of coarse with fine sand, than that the sand should be all of the same sized grain. The sand should likewise be as free as possible from earthly particles and dust. In mortar composed of lime and cement, the rule is, to proportion the sand with the quantity of cement used. Slaked lime will not bear more than a certain quantity of these substances, which quantity must not be executed, the cement itself being for the greater part inactive and playing the part of sand.

Hydraulic mortar that sets with sufficient rapidity, and to which a proper proportion of sand has been added, may be employed for casting tolerably massive objects, which are not subject to crack when dry. This enables hydraulic mortar to be employed for architectural ornaments which then combine great sharpness with durability, are very light as compared with similar figures of sandstone, and have the great advantage of being easily multiplied.

A similar application is that for casting water-pipes, on the spot where they are required, as proposed by Gasparin. The mould employed is a linen hose, like those attached to the fire engines, a few meters in length, which is filled with water and closed at both ends. A thick kind of bolster is thus produced, over which sand is sifted, and it is then laid upon a deposit of hydraulic lime and covered by pouring over it the same substance. When the whole has hardened, the hose is drawn forward, about the length of one foot, being left inserted in the tube, and a fresh length is cast. Water courses, thus constructed, must however, have a certain amount of fall, or the sand cannot be washed out, and will impede the delivery of the water.

When hydraulic lime is mixed with small stones, or with shingles from the bed of a river, or the sea, walls can be directly constructed of it, and a mass is obtained which resembles the erections with ordinary mortar, and is called *beton* by the French.

At Toulon, a mixture was used for the construction of the harbour, consisting of 3 parts lime, 4 Puzzolana, 1 smithy ashes, 2 sand, and 4 parts of rolled stones or shingles.

The great strength of walls, constructed with hydraulic mortar, is most clearly shown

by the experiments undertaken with a view to break beams constructed of brickwork. A 25 feet long, and 2½ feet wide beam, constructed with 19 layers of brick, bound together by Roman cement, in which, here and there, parallel strips of iron were enclosed, was capable of bearing, when supported at both ends, a weight of 22 tons suspended from the middle, before it shows any signs of fracture.

Turn Tables.

ALEXANDER TURIFF, Engineer, Paisley:

Enrolled December 23, 1848.

The improvements introduced by Mr. Turiff, have reference, more particularly, to turn tables of large size, such as are employed in turning an engine and tender at once. The first portion bears upon the obtainment of steadiness and freedom from vibration during the passage on or off, of engines or carriages. The main fixed supporting centre of the table is carried by a polygonal cast iron frame, to which are bolted a series of cast iron radiating arms, the latter being again bolted at their contrary or outer extremities, to the inner sides of the trace rail segments, upon which the supporting or trace rollers are carried. The top of the main centre casting, is bored out to a slight depth to receive the slightly rounded end of the main centre journal, which is a short cylinder strengthened by feathers, and cast with a top circular plate for bolting to the upper surface of a rectangular open frame, carrying the centre guide rollers.

The slight concavity of the main centre admits of an easy adjustment on any required side, by means of a set of four retaining rollers; by the rectangular frame just mentioned, so that the whole table can be at once accurately set by moving in or out any one or more of the stud spindles of these rollers. The adoption of a short main centre journal also admits of tables being put down in situations where the ordinary deep centres are quite inapplicable, on account of the depth of masonry required. In the second place, the usual malleable iron radiating arms for binding together the framing, are entirely dispensed with, and in their place, the patentee employs two parallel beams running right across the table, and set a short distance on each side the main centre, so as to embrace the sides of the rectangular casting bearing the retaining rollers, and from these beams springs a strong rectangular framework of cast iron bolted to the external ring of the table. Thirdly, a substitute for the ordinary malleable iron circular framing, employed to guide the trace rollers, is provided. A double panelled cast iron ring of segments bolted to each other, and to the ends of the beams forming the rectangular framing, carries the trace rollers, of which ten only are shown in the drawing before us. The rollers are placed between the two panelled rings, and are retained by pedestal caps bolted underneath.

An important modification is also introduced as a preventive of all or most of the strain to which the framing of the common turn table is subjected, by the variations or irregularities of the top and bottom tracerail. The

upper rail is dispensed with, and the rollers are guided entirely by the bottom one, being fast on their axles, which revolve with them.

The arrangement of the parts forming the top ring of the table, as previously explained, produces a most substantial frame, involving much less labor and metal, than is used in ordinary tables. The table is turned in the usual manner, by pinions working into segmental racks, cast on the inner surface of the circular framing.

The claims are—"the constructing of turn tables with shallow main centers, fitted with adjusting rollers and shallow journal bearings; the dispensing with radial or spider arms; as also the usual malleable iron circular framing; substituting in lieu thereof, the framing described; the mode of placing or supporting rollers to the lower side of the upper cast iron segments; the constructing of tables with one trace rail only, and lastly, the general arrangement of the table top."

Utica and Schenectady Railroad.—The excavation at the eastern end of the town of Little Falls, designed for the double track of the Utica and Schenectady railroad, has been completed, and the first locomotive was to pass through it on the 19th inst. The cut is made to pass through a mass of solid rock; is nearly 1000 feet long; the extreme depth is 35 feet, and it is 27 feet wide at the bottom. 30,000 yards of granite have been removed by blasting, continued for 17 months, and 1,600 kegs of powder were consumed in the work. Workmen are engaged in laying the parallel rails, and in a short time there will be a double track of the best quality of the heavy rail on the whole route. By this improvement, the worst and most dangerous curve on the road is avoided.—*Albany Argus.*

Concord and Claremont Railroad.—This work is advancing with a rapidity unaccountable, considering the state of the money market of the country at the time. As early as the 10th of August it will be open to Contoocookville, ten miles from this place, and probably by the 10th of September to Warner, eight miles further.—*Concord Statesman.*

Sullivan Railroad.—The annual meeting of the Sullivan railroad company was held at Charlestown July 17th. We learn that the old board of directors were re-elected.

The income of road since the opening in January has been about \$16,000. The travel in the month of June was 50 per cent. more than it had previously been.—The annual report was presented and read, which gave an encouraging statement of the present condition and future prospects of the road. As the report will be printed in a few days, we may hereafter give a more detailed statement of the condition of the company.

Cleveland and Buffalo Railroad.

At a general meeting of the stockholders of the Cleveland, Painesville, and Ashtabula railroad company, held at the Weddle House on the 1st inst., for the purpose of choosing Directors, Gen. Abel Kimball, of Lake Co. was called to the chair, and Heman B. Ely, Esq., appointed Secretary.

The following Directors were elected unanimously:

Hon. Alfred Kelley, of Columbus, Hon. Samuel L. Selden, of Rochester; Heman B. Ely, of Cleveland; Peleg P. Sanford, Esq., of Painesville; David R. Paige, Esq., of Madison; George G. Gillett Esq., of Kingsville; and Zaphna Lake, Esq., of Conneaut.

At a meeting of the Board of Directors subsequently, Alfred Kelley was chosen President, and Heman B. Ely Secretary. Mr. Kelley, however,

on account of other pressing engagements, declined acting as President; and the place is filled for the present by Heman B. Ely.

A committee consisting of Messrs. Lake, Gillett, Paige, Sanford, and Ely, assisted by Wm. W. Branch, Esq., were appointed to take the necessary measures and secure subscriptions to the stock of the Company, from Cleveland to the Pennsylvania State Line.

Within a few weeks the preliminary surveys will be commenced for the purpose of locating the road.

Fitchburg Railroad.

Receipts on this Road for July.—We believe, as a general thing, the railroad companies have done a light business this summer, as compared with their expectations, although most of them have made a gain on last year's business. All over the country the travel has been light, and on some of the New York and other roads the earnings are reported to have been less than last year. For the month of July, the earnings of the Fitchburg road amounted to forty-six thousand dollars, being an increase of about eight thousand dollars for that month over the same month in 1848.

Nashua and Worcester Railroad.

The annual meeting of this company was held at Worcester on the 12th instant. From the report of the Directors presented to the meeting, it appears that the cost of the road, including an estimated amount due for land damage, not yet adjusted, and a further amount necessary to be expended for additional buildings, is \$1,350,000; which is at a rate of \$20,670 the mile; the road being 45 55-100 miles in length.

The debts of the company amount to \$369,981; which includes the estimated amounts for land damages and additional buildings. The assets of the company are \$153,242; making the balance of debt over assets, \$215,730.

The whole number of shares of the capital stock, is 15,652. Of these, one-half were created by vote of the directors on the 17th of July, 1848, in pursuance of the authority given them by the stockholders at their last annual meeting. The shares created at that time were offered, in the first instance, exclusively to the stockholders. The number taken by them, or sold to different individuals, is 7250. The balance of the shares, together with a few of those originally subscribed for, and sold for non-payment of assessments and bought in by the company, were pledged and appropriated to the payment of interest due to stockholders, which amounts to \$30,000, and are sufficient for that purpose.

To realise funds which were required beyond the amount received from sales of stock, the road has been mortgaged to secure bonds to be issued under the amount of \$25,000. Of such bonds there have been sales to the amount of \$164,500; which make a part of the company's indebtedness.

The earnings of the road, from July, 1848, when only a small part of it was opened—from Clintonville to the Groton Junction—to July 1st, 1849, have been \$52,333. The cost of working the road for the same time has been \$36,778. More than one-half of the entire receipts has been during the last three months. In the month of June were a fraction short of \$10,000.

The road was in progress during the severest pressure of the money market, and like other roads similarly situated, its cost was somewhat increased from this cause.

This is a very important road to the manufactur-

ers of the large towns of Massachusetts and New Hampshire, as it brings them in direct railway connection with New York, which is one of the great markets for their products, and from which they receive large supplies of raw material. They can now forward to this market with the same ease and facility that they can to Boston. It cannot fail being advantageous to Worcester by vastly enlarging her connections with the country, and giving increased facilities to the extensive manufacturing interest of that city, which is now one of the principal manufacturing towns of Massachusetts, and which owes its importance almost entirely to the fact of her being the centre of an extensive railway system. It has been chiefly through the influence of Worcester that this road has been built. We believe too that this road will eventually pay well upon its first cost. Offering a new route for travel, some time must elapse before she can divert this from its old established routes, and turn it into a new channel.

The following is a list of its Directors:—

Pliny Merrick, of Worcester; Thos. W. Gillis, Thos. Chase, Nashua; Asa F. Lawrence, Pepperell; N. P. Smith, Groton; Jacob Fisher, Haverhill; N. Bigelow, Lancaster; Stephen Salisbury, William A. Wheeler, G. T. Rice, Isaac Davis, Worcester; Joel W. White, Charles Johnson, Norwich; Alexander De Witt, Oxford; Edward Lamb, Boston.

President, Pliny Merrick.

Chief Engineer, J. F. Miller.

Superintendent, J. W. Stowell.

St. Lawrence and Lake Champlain Canal.

A meeting of gentlemen favourable to the construction of the above projected work, was held, yesterday, at the Merchants' Exchange Room, when it was moved by J. Fisher, Esq., that the Honorable Joseph Bourret do take the Chair, and Mr. Theodore Hart was requested to act as Secretary.

The meeting having been constituted, John Young Esq., explained the object of its having been convened to be the appointment of a committee to meet and co-operate with the committee chosen at the late meeting at Troy, in visiting the site of the proposed Canal.

Moved by Sheriff Boston, seconded, by D. Torrance, Esq.:

Resolved.—That this meeting hail with much satisfaction the proceedings of the Citizens of Troy N.Y., at their meeting of the 21st instant, on the subject of connecting the waters of Lake Champlain and the River St. Lawrence by Canal, and will as far as possible, co-operate with them and others in carrying out so desirable and so important a work. Carried unanimously.

Moved by G. Cartier, Esq., M. P. P., seconded by D. Kinnear, Esq.,

Resolved.—That this meeting hereby appoint the Hon. Col. Tache, Jason C. Pierce, Esq., of St. Johns, William Dow, Esq., John Glass, Esq., Sheriff Boston, John Young, Esq., John Ostell, Esq., Jacob De Wit Esq., M. P. P., and Thomas Ryan, Esq., President of the Board of Trade, a committee, to meet the committee appointed from Troy, to visit the site of the proposed Canal, with power to add to their numbers; and to call another meeting of those interested in the proposed Canal, at such time as they may seem fit. Carried unanimously.

Mr. Kinnear, then, called the attention of the meeting to the indefatigable exertions of John Young, Esq., his energy and perseverance, in forwarding the great object they all had in view, of uniting the waters of the St. Lawrence with those of Lake Champlain, and of, thus, adding the final link to the grand chain of our canals, and concluded by proposing, seconded by Mr. Cumming, a vote of thanks to Mr. Young, which was unanimously carried. In returning thanks, Mr. Young, concisely, pointed out the vast advantage this canal, when constructed, would confer upon the trade of the St. Lawrence, and particularly upon that of our city.

The Hon. Chairman having left the chair and Mr. Sheriff Boston having been voted into it, the

thanks of the meeting was moved, by John Fisher, Esq., seconded by John Frothingham, Esq., to the Hon. Mr. Bourret for his services on the occasion. Carried unanimously.—*Hamilton Spectator.*

AMERICAN RAILROAD JOURNAL.

Saturday, August 18, 1849.

Affairs in Canada.

We have hitherto forbore the expression of an opinion respecting the great questions at present and for some time past, engrossing the attention of our Canadian neighbors. Our silence however must not be attributed to the want of attention to, or the absence of interest in the progress of events in the British Provinces. Their geographical position, natural resources and habits, and characteristics of the great bulk of the people, who inhabit them are objects of the greatest interest, to the inhabitants of this country. That we have not occasionally alluded to the political occurrences in the Provinces has resulted in part from the want of reliable information and in some degree from the peculiar subjects to which this Journal is more particularly devoted.—When it is considered however, that many of the Eastern and Western States have a direct interest in the construction of most of the projected railways in Canada, we trust we shall be excused for offering a few remarks at the present time on the subject.

We would premise what we have to say by stating that our attention has very recently been directed to the subject by a Gentleman of intelligence, who has just returned from a tour of some six weeks through both sections of the Canadian Province. Our informant states that he lost no opportunity to make himself acquainted with the wants and feelings of the people in every part of the country. The difficulties under which the province appears to be laboring are both political and commercial. Political evils, when accompanied by commercial and general prosperity, as we often witness in the old world, will long be borne by a people, without ever a murmur, whilst they are sure to excite discontent in the minds of nations not sunk to a condition of degradation and apathy, when attended with great commercial distress.

The expenses of the civil government of Canada it appears, by statements made at the convention which lately assembled at Kingston, are at least three times greater than those of the State of New York, which is twice as populous and probably ten times as wealthy. This enormous disproportion in the expenditure of the province, as compared with this great state unquestionably arises from the difference in the two systems of government. The Canadian government is as nearly as possible in form, the transcript of that of the Mother country. But our neighbours are beginning to discover that it *only* corresponds in form and external appearance with that great fabric called the British constitution, and that they have neither the material, nor the means for practically carrying out and working so complicated and costly a machinery. They therefore very naturally ask themselves, "why should we cling so pertinaciously to a system, which experience has taught us can never be wholly transplanted into American soil? Why should we pay a governor \$35,000 a year to contribute to his private fortune when the President of the American Union only gets \$25,000? Why should we pay for the maintenance of three or four benches of judges and two sets of officers to manage the heads of departments—one for Canada East and another for Canada West—at the rate of from four to six thousand dollars each individual, whilst the largest State in the union as

well as the Federal government itself has only one set of supreme judges and one set of state officers?"

But as we before observed, these evils might long have been borne, how long it is difficult to say, had the province continued in a state of commercial prosperity. The removal, however of the incidental protection which the Colonies of England enjoyed in her markets for their staple products, by the free admission of foreign corn, has struck a death blow at the commercial prosperity of Canada in particular, her staple being wheat. She had just constructed at vast expense a series of ship canals from Lake Erie to the ocean, works which for magnitude and splendor, are not surpassed by those of the most opulent nations of the earth, when the sudden repeal of the British corn laws destroyed at a blow the source from whence these great undertakings were to derive their business. The province is thus left saddled with an immense debt contracted for unproductive works.

Canada is also suffering in every branch of industry for the want of railways, the great necessities of the age. We have frequently asserted it as a fact and have adduced numerous evidences in proof of its correctness, that a country not possessing railways can not compete with neighboring countries which have introduced them extensively, in producing any of the elements of national wealth. This fact is beginning to be felt by the Canadians. They see thousands upon thousands of miles of railway in successful operation in the various States upon their borders, and they witness the astonishing results they every where produce as well as the facility with which capital is here obtained for their construction. Is it at all surprising that they should inquire into the causes which have prevented their introduction into their own country? We have also had occasion to point out the admirable adaptation of Canada for a great system of railways, and the certainty of their yielding a handsome return to the shareholder, either from local business or from their connection with American roads already yielding large profits. In doing so however we have not been as pointed as we might have been in stating the real difficulty under which the Canadians as a people labor in procuring capital. We had no desire to throw a brand of discord into the province, feeling certain that sooner or later our neighbours would open their eyes to the true cause themselves. This they are now doing.

Canada whilst she remains a colony can never acquire such a degree of credit as to hold out any very powerful inducements for the investment of capital. Her government is regarded as in a state of transition and such acts as the rebellions of 1837 and 1839 and the riots and burnings of 1849 are pretty conclusive evidences of the correctness of this opinion. Canadians must not therefore be surprised that both English and American capitalists prefer keeping their money at home and contenting themselves with a less profit to laying it out in a country which has not yet acquired a settled and fixed condition. Just suppose that the British provinces should have to pass through an ordeal similar to that of the American revolution, what would become of investments of any kind? If what we are told be true that there is a small but desperate party in the Canadas which entertains views and prejudices similar to the faction which opposed American independence, such a struggle is not unlikely to happen. We trust however that the able and wise men who now rule England, will avert such consequences by voluntarily anticipating what all men admit

must sooner or later happen, and peaceably establish the whole of the North American provinces into independent nations. Our neighbors can then consult their own interests and feelings in reference to "annexation" to this country. Should they ask admission into our confederacy, we can assure them they will meet with a cordial reception.

If however they prefer a confederacy of their own, they may equally depend upon our friendship and cooperation in all enterprizes and matters of mutual interest. But we think it will be so obviously their interest to join our Union, that they will not be long in deciding in favor of this course. To make their great natural and artificial facilities for internal water communication profitable, it is absolutely necessary, that perfect free trade should exist between them and us. This they can scarcely hope for without coming into the Union.

There is one thing upon which we should like to set our Canadian friends right, or rather that portion of them whose predilections set strongly in favor of British connection, and that is the light in which they are in the habit of viewing the people of this country. These Gentlemen seem to regard us as the natural enemies of England, whereas our kindred, associations and interest all combine to render the two nations the natural allies of each other. We feel an equal pride with our brethren in Canada, in being the descendants of Britons. Indeed, if there is any difference, we have more to congratulate ourselves upon, as the elder branch of a common stock, in that we have raised up a great and independent Anglo-saxon nation on this side the Atlantic. We not only speak the same language but our laws, institutions, and the whole fabric of our society, both moral and political, are simply modifications of those of the mother country.

In reference to the material interests of the British provinces, we can assure our friends that they will find no difficulty in procuring the means to build the several projected lines of railway, and of establishing extensive manufactures when they have once taken their place among the independent nations composing this confederacy. But in saying this much we can further assure them that the matter rests entirely with themselves. It is the settled policy of the Federal Government not to interfere in any manner, either to hasten or retard the progress of events on the other side the lines.

We are informed that many Canadians object to annexation on the ground that slavery exists in a large number of the States, and that the present revenue of the Provinces, derived chiefly from customs duties, would go into the Federal treasury. To the first of these objections we would answer, that it is an erroneous supposition to think that they would compromise themselves on this point. Let the people of Canada and the other Provinces look at the position of this State, and of all the other free States, and they will perceive that the question of slavery is one which can in no way cast a reflection upon them. It is purely a State institution; and neither England nor any other nation has ever refused to make treaties or enter into alliances with other nations because they tolerated slavery.

As to the loss of the customs revenue, and any other sources of public income, we are fully convinced that this would be far more than counterbalanced by the increase of tolls from public works, which are the property of the Province, that would be immediately caused by the increase of business upon them. The impetus that would be given at once to the local business and enterprise of the Province by becoming States, and the rapidly increas-

ing trade of the west, which to a very large extent would be diverted, under a system of perfect free trade, through the Welland and St. Lawrence canals, would produce a revenue far greater than that which would be surrendered to the Federal government. Let the Canadians look at the revenues yielded by the public works of New York, and many other States, and they will see what will be the result in their own case under the new order of things. But the advantages will not stop here.—They will soon find that they will have a simpler, better and more economical government than they at present possess. They will see that it is possible to be governed, and well governed, under a thoroughly responsible system of government, at one-half or one third the present cost.

But we are disposed to carry the argument still further, and admit that the Canadians might lose more than they gain in the shape of revenue; even then they will be immensely the gainers by the change. The farmer would always have open to him a large and a certain market for his produce. The gradual establishment of manufactures would create a home market for such articles as will not bear transportation to a distant one. And the rapid introduction of railways would stimulate all kinds of industry, and raise the value of all property at least one hundred per cent., causing an equalization in its value over distant parts of the country, so that farms one hundred miles distant from market towns will be nearly as valuable as those in their immediate vicinity. It would not be difficult to demonstrate in figures that the entire value of real estate in Canada would be doubled, perhaps trebled by the results which a union with this country would produce.

Having said thus much, we shall look forward with interest to every movement of our neighbors, both in Canada and the Lower Provinces of Nova Scotia and New Brunswick.

Mr. Whitney's Railroad—New York Chamber of Commerce.

In looking over a morning paper a few days ago, to see what had transpired since the previous days' report of events, we suddenly came upon this formal announcement:—"the Chamber of Commerce upon Mr. Whitney's Plan of a Railroad to the Pacific," heading a long report signed by D. B. Ogden, Chas. A. Davis, Chas. King, L. Bierwith and Oliver State Jr. Committee of the New York Chamber of Commerce, all men of mark in this great city. Here, said we, is something from the right quarter;—here are the opinions of one of the most distinguished commercial bodies in the world sitting in judgment upon one of the grandest schemes ever proposed.—Here shall we find discussed and settled all those facts in relation to this great enterprise which come within the province of gentlemen standing at the head of the commercial and financial world—the manner by which shall be provided the ways and means for this great work—the sufficiency of those proposed in the various plans before the public—the office that such a work is capable of performing as an instrument of commerce, etc., all those facts which, in similar undertakings, are left to the determination of the man of business, as those which relate to the physical characteristics of a road, are to the engineering profession. With such impressions, we ran eagerly thro' the report to see what were the ultimate facts in relation to this part of the project determined by competent authority?

The report after stating the necessity of an internal communication with our Pacific possessions, gives a brief account of the various propositions be-

fore the country, to accomplish this object. The first is that of Mr. Whitney, of which we have presented our readers with its main features. Another plan is that of a post road simply for the conveyance of the United States mail and passengers by the construction of an ordinary road. The third is Boston plan, from its originating with P. P. F. DeGrand of that city. This plan proposes the formation of a company with a capital stock of \$100,000,000, of which government is to subscribe one-third, and appoint one-third of the Directors. After individual stockholders shall have paid in \$2,000,000, which is considered as a pledge for the good conduct of the Directors, the United States Government is to issue its script, bearing interest, to the company for \$98,000,000 to complete the road, retaining the usual security upon the road, etc. It is also to cede to the company a strip of land ten miles wide on the north side of the road, a road-bed 100 feet wide, and the necessary lands for station houses and depots.

The objections that exist against these several plans are thus stated by this committee:

"Objections are urged against the plan of Mr. Whitney, that it is too great an undertaking for an individual, whether we consider the difficulties to be overcome, or the result to be accomplished, and that such a road should belong to the people or to the government for their use, except such share as may or should be held by states, or companies, or associations, for the purpose of practical management; doubts are entertained, arising from the past experience of some of the states, how far the sale of the public lands can be relied on to supply the means of construction, and it is feared by some that, after a short progress, this resource may fail. If, however, for a certain distance from the commencement of the road, the 192,000 acres on each 10 mile section, should sell for more than the cost of construction, it is thought provision should be made after allowing a reasonable compensation for time and trouble, to pay over the surplus to the Commissioner, to be applied, if wanted, during the progress of the work, or if not required for that purpose, then to await the decision of Congress; in order that on the one hand the road should not stop or be delayed for want of this fund, and on the other, if unexpected success should attend the sale of the lands, that the people might share the benefit. A further objection urged, is the unavoidable delay that it is thought must attend the making of such a road from the sale of public lands, most of them, as yet, beyond the verge of civilization, and the value of which must be derived from the settlements to accompany and follow the progress of the work.—Fifteen or twenty years is the general estimate of time for its construction. It is sometimes thought that a quarter of a century might be required for its completion.

As regards the post road or mail route, your committee are of opinion that roads of that kind, although they have proved so useful and beneficial in their days, may now be considered, at least for the present purpose, as behind the age; for the would not be likely to meet the wishes and expectations of our people. If nothing else was in contemplation, or could be accomplished, such a road would, if course, deserve consideration, and while, as a pioneer, it may find many advocates, yet even in that light, it would soon prove inefficient for the object in view, and might, and no doubt would, delay the commencement of the only permanent and efficient highway across the continent.

The objection to the Boston plan, apart from the opposition that may probably be enlisted against an act of incorporation by Congress, of the kind proposed, exist in the emission and use of so large an amount of United States Stock, as well in the creation of the debt itself, as the distributing effect it might produce in the general money market. Besides, this is considered in many respects too important a work to be accomplished by a corporation.—Your committee are also apprehensive that the expense of a work of this kind, constructed with the proceeds of the stock, for an incorporated company, would be too great for the objects in view. The tolls, in such case, must be remunerative, and, therefore,

high enough to pay interest and dividends, besides repairs and the current expenses of the road. It is accordingly feared that the rate of freight would be too high for the permanent interests of commerce to sustain. This road, intended to be a *short and direct* route between Oceans and Continents, must, in order to answer its great ends, become a *cheap* mode of conveyance for the products of a great portion of the world."

After having reviewed the several schemes above named, and stated its objections to them, the judgment of the committee is given as follows:

"Having thus stated the principal plans that have been proposed, together with the prominent objections respectively urged or entertained against them, your committee respectfully submit, that, in their opinion, the sales of the public lands appears to present the only means likely to prove sufficiently unobjectionable, or that can be deemed both attainable and available for constructing a railroad to the Pacific—for with respect to the delay that is apprehended from a reliance upon the resource, it seems evident that money alone could not be relied on to compass the means to construct a railroad of such extent through unsettled lands—population must be induced to accompany its course, when by the aid and facilities it would afford, the settlement of the lands would necessarily follow their sale, and as a demand for labor was created, both labor and subsistence would be furnished at the same time, and the future progress of the national road would be accelerated according to the favor it might receive or deserve at the hands of the people and their representatives."!!!

It then wound up with the following qualified endorsement of Mr. Whitney's plan:

"Your committee, therefore, are in favor, generally, of the plan of Mr. Whitney, as contained in the bill submitted to the Senate—with two exceptions. They think that the proceeds of the lands along the five miles of road which are allowed to be sold by Mr. Whitney, for his own use or benefit, should be accounted for; and the excess beyond the cost of construction for the ten miles, after allowing a liberal compensation for time and trouble, should be paid over to United States commissioners, to constitute a fund to be applied to the purpose of the road whenever required. They also think that the work itself should not belong to an individual or to any association of persons, but should become the heritage of the people."

Conceived in true mercantile spirit. Mr. Whitney to have nothing for his pains but a "liberal compensation" for his time and trouble, and nothing to do with the road after it shall be completed. The chamber however reversed this decision of the committee, for on the matter coming before this body—

Mr. P. M. Wetmore opposed the recommendation of the report which contemplated the withholding from Mr. Whitney the benefits that would result from the completion of the road and vesting the property in the United States. He did not suppose any man could be found who could devote his life and means to forward an enterprise of which the future would ruin him, and the success—if successful—must accrue to the benefit of others. Besides, it was inexpedient in his view that the Government should have any property or interest in the matter.

Mr. Ogden vindicated the report as just at once to Mr. Whitney and to the public. After further debate, Mr. Lee proposed the following resolutions as a substitute for the resolutions of the Committee, which were adopted:

Whereas, The construction of a railroad to connect the Atlantic with the Pacific, in a direct line across the Continent, has become of vital importance, and whereas the plan of Mr. A. Whitney, of New York, for the construction of such a communication, in its leading features, as well as the favor it has met with from a large portion of the people, disembarasses the undertaking from the sectional and constitutional objections which so often have impeded internal improvements. Therefore,

Resolved,—That we highly approve the great fea-

tures of Asa Whitney's plan for the construction of a railroad from Lake Michigan to the Pacific, and that we earnestly recommend its immediate adoption to Congress.

Resolved, That a copy of these resolutions be transmitted to our U. S. Senators and members of Congress from this district.

Mr. Lee then moved that so much of the report of the Committee as conflicts with the above report, be stricken out. On this question the vote was a tie, and of course the motion failed.

This resolution was then introduced and passed:—

Resolved, That the report of the select committee be accepted by the Chamber; but that in lieu of the conclusion arrived at by the committee, the above resolutions be adopted as the sense of the Chamber.

The Chamber then adjourned;

And for all the light it has thrown upon the subject, we are just as wise as when we commenced reading the report; not quite so well off, however, for such is the confusion of ideas in that part of the report which proposes to give the opinion of the committee, we confess ourselves a little bewildered in our attempts to decipher its meaning. We expected something different from this stereotyped unmeaning and wholesale approbation of the plan, when it is considered that history does not furnish a parallel to the vastness of the work proposed to be executed by a single individual. We had a right to expect that gentlemen occupying so conspicuous a position would take up and examine this subject in a manner worthy of it; in the same manner that they would any enterprise in which they are proposing to embark—to see whether it can be accomplished by the means proposed, or whether the end to be gained will justify the outlay. That instead of resorting to this natural process they should endorse in blank, as a "matured scheme," that of a person, who does not profess to be a competent judge in these matters from any previous education or training, who has not summoned in support of his views the opinion of those persons, who from such education and training, are alone capable of maturing and presenting a plan that shall be entitled to confidence—a plan which, in itself, contains admissions and statements which constitute a perfect *felo de se* to the whole scheme—is to us marvellous. That it should find such ready approval by public bodies before it has secured the sanction of a single engineer of standing among us;—and which, we have no hesitation in saying, no engineer would hazard his reputation in approving, is a good illustration of our credulity.

But even supposing the construction of the road possible on Mr. Whitney's plan, is there any probability that it would be constructed? Not the slightest. He gives government no guarantee that he will build it. He may abandon it when he chooses, and get one half of the sixty miles of the land set apart as fast as he goes. Now, it requires no argument to prove that the lands nearest to either terminus of the road are much the most valuable, and that they become less and less so as you leave these points. The cost of building the road also increases very rapidly as you leave the starting points. All the timber for the first 12 or 1600 miles of the eastern part of the road must be transported over the whole length of this line. Now if the lands can furnish sufficient means to build the whole road, those on the first 3 or 400 miles must be worth three or four times the cost of the road for this distance. The great value of these lands above the cost of the road running through them, must be looked upon as a reserve fund to build it through that section

where they are of less value, and the cost of building very great. Up to a certain point, therefore, by building the road he is accumulating means to carry it through that portion of the route which can furnish but little or no aid to it. When he leaves this point, he then begins to exhaust this reserve fund; so that the whole increased value of the lands set apart may be required for the ultimate completion of the road. Now will he push the road further than that point, beyond which he will exhaust the fund he has thus accumulated? He is under no obligation to do so. If he does, he will, from motives of benevolence and patriotism, and a desire to benefit his fellow man, be content to sacrifice his time and a fortune which he has in his grasp for these laudable objects. Such examples are too rare to lead us to believe that his will prove an exception. Such transcendent benevolence is not indigenous in New York soil. We do not believe that Mr. Whitney expects to lose one cent in the prosecution of his road if he obtains the privilege of commencing it, nor do we believe he would go one inch further than he finds it for his interest to proceed. He would undoubtedly locate the road for a few hundred miles in either end. He would take immediate measures to ascertain what would become the great commercial port of the Pacific. By running his road fifteen miles either north or south of this point, and building ten miles, this would give him the privilege of appropriating to 30 miles of country contiguous to the best port on the Pacific. Are the people of this country prepared to throw into Mr. Whitney's hands their best seaport for ten miles of railroad which may not be worth one cent to them when completed? We will believe no such thing. We think that upon a little examination they will see that in Mr. Whitney's proposition the advantage is all on his own side, and that his plan places it in his power to make an enormous speculation out of government, without any risk or liability on his own part, or any corresponding advantage on theirs.

"But" says Mr. Whitney, "government can lose nothing, even if I should build only a portion of the road, and receive thirty miles of the land as far as I go. The thirty miles it retains is made much more valuable by the road, than the whole would be without it. Therefore I may be well permitted to try the experiment, because if I fail, nobody is the loser." Now as far the Pacific terminus is concerned, we have shown that government may lose largely by granting him what he asks, and what it loses he gains. But for the sake of the argument we will admit that on the eastern end of the route, in case of failure on his part, the lands retained by government on the line of the road as far as it extends, would be made as valuable as the whole would be without it; and that consequently it would lose nothing by allowing him to undertake his experiment. The conclusive answer to this is, that if government is to adopt a system of railroad construction to increase the value of her wild lands, it is its duty to make the best bargain it can. If one hundred miles of road can be built for a strip of land fifteen miles wide, there is no reason why Mr. Whitney should have thirty miles for the same service. Government should adopt the same policy that it pursues in similar cases, let out the contract to the lowest bidder, and drive the best bargain it can make.

Before we had thoroughly examined Mr. Whitney's plan, our general impressions were enlisted in favor of it as strongly as any person's could be. We were, as every body else is, impressed with the

importance of opening a railway communication across the continent. We believed that the public lands should be made to furnish the means, if possible; and taking for granted the various propositions laid down by him, the conclusions to which he arrived seemed plausible enough. We now feel satisfied that the favorable opinion entertained by the public for it, rests upon no better foundation than did our own, and we are as fully satisfied that a careful examination into its merits will impress it as strongly with its impracticability as it did us.—Believing it to be entirely impracticable, we feel it our duty to state our conviction and do what we can to prevent government from embarking in a scheme which will involve them in a mortifying failure, and defeat for years the very object it is seeking to accomplish.

Remarks on Patent Inventions.

[A very able article on the Progress of Mechanical Invention is given in the last number of the *Edinburgh Review*. It is a valuable exposition of the mania that has begotten many persons for taking out patents for the most perile inventions, founded upon gross ignorance of the common principles of mechanics. We are induced to transfer to our columns a lengthened abridgement, of the paper, in the hope that it will in some measure arrest the folly of inventors, and prevent many artful scheming parties palming upon the public pretended inventions, for the purpose of getting up a company and duping the subscribers out of thousands, for a patent that is not worth a straw.]—*C. E. and A. Journal*.

The Review very properly observes that—
"The simple perusal of their own specifications aided by a very moderate degree of scientific knowledge, will suffice to prove that, nine times out of ten, all the labor and expense that have been lavished upon the production of these cunningly devised engines could result in nothing but total failure. Nor do the inventors appear to profit by example. In spite of the abundant warnings held out to them in the fate of their predecessors, they persist in adopting the same inefficient means, the same defective construction; or in hopeless attempts to extort from some natural agent the performance of tasks for which it is manifestly unfitted. Nay, the identical mechanism, that has broken down a dozen times in other hands, is once more made the subject of new patents, by men who are not only ignorant of the simple scientific principles which would have taught them their folly, but who do not know the fact that the selfsame ideas have long since been worked out, and abandoned as impracticable.—Without skill to shape their own course, they cannot perceive the scattered debris that might warn them of impending shipwreck. It is credible that ingenious men, who have seen or heard of the suspension tunnel, and the electric telegraph; should still waste years in search for the perpetual motion? Yet such is the fact; and one such machine, at least, may even now be seen in London, by those who have more faith than knowledge, pursuing its eternal revolutions.

In the majority of instances, we apprehend that these inventors are but little acquainted with the practical details of the branches of art or manufacture whereupon they exercise their ingenuity. They attempt to do better than other men, things which they do not know how to do at all. And if, perchance, some remark be hazarded as to their want of experience, they consider it sufficient to reply, that A. K. Wright was a barber, and Cartwright a clergyman; that Sir William Herschel taught music before he became the celebrated astronomer; and Sir Michael Faraday passed the earlier years of life in practising the handicraft art of bookbinding.

Considering that the state of the law renders the privilege of a patent both expensive and difficult of attainment, and that the whole cost, in addition to that required for completing the invention, must be incurred before any benefit can possibly be derived;—it becomes an inquiry of some interest to trace the motives that led men, many of whom are sufficiently needy and busy already; to embark upon enterprises so hopeless. One chief cause may, perhaps, be detected in that prosperity to gambling which is so

unfortunately so prevalent in every stage of civilization. In literature, as in manufactures—among members of the learned, the military, and even the clerical professions, as among mechanical inventors and merchant adventurers,—the reward of industry are divided into great prizes, and blanks. Success admits the aspirant within the dazzling circle of wealth and fame; failure condemns him to oblivion, and too often to penury. Whatever may be the effect upon individuals—and to him who has aimed high, even failure is not without its consolations—there can be little doubt, that in a national point of view the results are advantageous. The general standard of excellence is raised. When more men "dare greatly," more will achieve greatly. A large amount of talent is allured to engage in active careers, and to endure in patience their inevitable fatigues and disappointments; while from time to time, discoveries and works of magnificent novelty and utility are contributed as additions to the stores of national wealth.

Abstract science, until a comparatively recent period, was the almost exclusive occupation of all men claiming to rank among the "sect of the philosophers." With the brilliant personal exception of Watt, they appear to have considered it beneath their dignity to carry out their learned theories into any practical or profitable employment. Great mechanical ingenuity they no doubt displayed; but it was devoted to the construction of instruments adapted to scientific research, some of which, it is true, have since been found of utility to the general public. A few investigations were diligently prosecuted which promised to be of national benefit, such as those relating to the longitude, chronometers, and the lunar theory; but they were entertained rather as favorite scientific puzzles, inherited from past generations, than as problems whose solution would prove vast commercial good. Davy's safety lamp was almost an exception, at the time it appeared: and people wondered to hear that Herschel had made anything in the vulgar way of money by his telescopes, or Wollastanum by his platinum.

The "curiosities of the Patent Rolls" would furnish materials for a copious chapter in the same work devoted to the exhibition of the eccentricities of intellect. Even the titles affixed as labels to a multitude of inventions suggest very curious reflections. In the list of patents registered during a part of 1846-47, we find, along with a family of contrivances for personal and household uses, one for an "anti-emergent rat-trap;" others for "improvements in bedsteads,"—in pianofortes, saddles, and pen-holders; for "a new fastening for shutters;" or securing corks in bottles; and for "certain improvements in the manufacture of spoons." Articles of dress supply their quota. We have improvements in "sewing and stitching;" "a new mode of applying springs to braces;" improvements in "hats and bonnets;" an "improved apparatus to be attached to boots and shoes in order to protect the wearer from splashes of mud in walking;" and along list of inventions connected with the application of gutta percha.

It is a theory rather in favor with inventors, that many of the most brilliant discoveries have been made by accident; and indeed the examples are sufficiently well known, of apparently fortuitous occurrences giving birth to very wonderful realities.—But if we could inquire more accurately, we should probably learn that the lucky accident had but set in motion a certain train of thought in an already prepared mind; while by far the majority of cases exhibit to us the new discovery elaborated by reiterated trials and improvements from its rude original. A word dropped in casual conversation suggested an idea to the mind of a clergyman (Cartwright) of practical and benevolent tendencies; which, under the influence of contradiction, became hot strong enough to absorb all his energies for the production of a power loom. On the other hand, we hear of a practical manufacturer (Radcliffe) becoming convinced that it was possible and desirable to effect a certain operation by machinery instead of manual labor; and shutting himself up with workmen and tools for many months, until he emerged from his seclusion with a warp-dressing machine, to testify to the success of their prolonged exertions.

Even the simplest looking contrivance require knowledge, especially mathematical knowledge, of no ordinary degree at every step. The mere calcu-

lation, for example, of the best form to be given to the teeth of wheels, which are intended to transmit motion reciprocally, requires a process of analysis beyond the competence of ninety-nine in the hundred even of educated men. In more primitive stages of the mechanical arts great nicety was not required. The cogs were then rudely notched in the peripheries of the wooden wheels by a saw or chisel. But now that more perfect workmanship is necessary, the mechanist must form the surface of the teeth into such a curve, that they shall roll instead of rubbing on one another, as they successfully come in contact, and the friction and wear of material be thus reduced to a minimum. It is true that many of these calculations are already prepared and published in tabulated forms, and therefore the inventor is not called upon to calculate them for himself.—but few can hope to become successful improvers, who are not at least competent to understand their nature, and able to determine the particular points of every new contrivance where such considerations become important.

Were it not that no exercise of tyranny would be more fiercely resented than any attempt to interfere with the true born Englishman's privilege to throw away his time and money at his own pleasure, we could suggest the appointment of certain boards of examiners, whose approval should be first secured before any invention, purporting to be novel, could be admitted to the expensive honors of a patent.

A more popular suggestion has been made, that every patentee should be required to deposit in some public museum an accurate model or specimen of his invention; which would thus prove highly useful as an object of interest and instruction to others, as well as by rendering more easy of determination any litigated question of priority. We should anticipate this further advantage from,—the attempt to construct his model would often leave the inventor self-convicted of the inutility of his scheme and save him much disappointment. Even the preparation of an accurate drawing often has a salutary effect. Mr. Babbage relates that in the constructing of his calculating machine, not one single portion of the works, although these were of extraordinary complication, required an alteration after it was once made, owing to the admirable care which had been bestowed upon the drawings.

The *limitary principles* (by which term we propose to specify everything, whether quality or accident, which tends to limit our progress towards perfection) may be divided into two great categories,—including, first, those derived from the natural properties of matter; and secondly, those arising from the construction or arrangement of the mechanism necessarily employed. The high importance of the former class is at once manifest. Difficulties which arise from construction may be overcome or eluded; but the task is very difficult where we find that Nature herself raises the barrier in our path. Man has succeeded in rendering almost every quality of every various form of material substance available for some purpose of utility. On certain occasions only, and for certain purposes, some one or other of these qualities will be found to stand in the way of his success.

Chemistry has gone far towards establishing the hypothesis that all natural bodies are susceptible of assuming three forms—the solid, fluid, and gaseous,—according to the degree of heat by which they are effected. At all events, it is certain that heat exercises, in various proportions, such an influence on the constituent atoms as to destroy or diminish their mutual attraction; and even when the mass does not subside into fluidity, it loses its strength and cohesive properties, and becomes disintegrated. The uses to which this property of matter have been applied are infinite. Let us see how it may become a *limitary principle*.

It is supposed that the possible heat of a burning atom (in which of course we shall find the theoretical limit) is very far above the highest known temperature attained in our furnaces; and it would consequently follow that we might more nearly approach that limit by varying the arrangement of the fuel and the supply of air for combustion. This has been accordingly done, until we have found our progress stopped by the impossibility of discovering any substance whereof to build our furnaces, which will bear the heat. Porcelain, fire-brick, and plumbago, in various combinations are

adopted: but they either crumble or sink down into a pasty mass, as the fire is urged. The qualities of matter itself here act as a complete *estoppel*; and if we would experimentalize further upon the phenomena of caloric, we can operate only on a minute scale by means of the gas blow-pipe, or the heated arch evolved from charcoal points interposed in a galvanic circuit. But for this limit, many useful purposes might be accomplished, by the mutual actions or changed forms of material bodies when subjected to the intense action of heat. For instance, in the case of platinum, we might then separate it from its ores by the ordinary methods of smelting and fusion; in place of being compelled to adopt the laborious and costly process of solutions in acids. The steam-engine offers an example nearly parallel. The power of a steam-engine depends primarily upon the area of surface exposed to the action of the fire, and the intensity of the fire itself. In marine and locomotive engines, where space must be economized, the practical limit is fixed only by the degree of heat; and this, of course, must be kept below the utmost limit which the material of the boiler furnace will endure. As yet, there has not been discovered any material better fitted for this purpose than iron; and we have made our fires as fierce as the melting point of iron will permit: even now, the fire-bars are destroyed even upon the first journey.

Farther than this we obviously cannot go, so long as we use water for the power-producing agent. Attempts have however been made, to conquer the difficulty by taking advantage of some other properties of matter in its relation to heat; based upon the fact that the "evaporating point"—that is, the degree of heat at which fluids expand into vapour—is found to differ considerably in different liquids, just as does the melting point of solid bodies. It would therefore appear probable that, by filling the boiler with alcohol, which boils at 173°, or with ether boiling at 96° Fahrenheit, the tension of the vapor and consequent power of the engine, could be increased without increasing the heat of the furnace. As both of the above named fluids are expensive, it was first requisite so to contrive the machine that no loss should be experienced, but the whole vapour be recondensed and returned to the boiler. For this purpose a variety of ingenious contrivances have been suggested, the earliest of which, and one perhaps as effectual as any other, was patented by Dr. Cartwright, in 1797; while new forms of mechanism, with the same object in view, are even still appearing on the patent rolls from time to time.—Whether the ingenuity of man could do, has probably therefore been done: but the practical utility of all these contrivances was destroyed by the influence of other properties of matter altogether overlooked, although of necessity involved in the question.

To be continued.

The Portland Company.

We invite the attention of railroad companies and all parties wanting Engines, Cars or other machinery to the advertisement of the Portland Company in the present number of the Journal.—From the Portland Argus we take the following account of it:—

PORTLAND COMPANY.

The stockholders of the Portland Company held their annual meeting at their works on Tuesday, the 10th inst; the attendance of stockholders was very large.

The reports of the Directors and Treasurer were read by John A. Poor, Esq., President of the company.

We invite the attention of our readers to the report of the Directors of this company, in to-day's paper. It is drawn up with evident cautiousness, and may be relied on as a true statement of the affairs of the corporation.

It is creditable to the officers that they have succeeded, in spite of the heavy pecuniary pressure of the past year so well.

The Portland Company is the largest experiment in home manufactures ever undertaken in this city. The result shows what can be done by well-

directed enterprise. Portland may yet become an important manufacturing city, if our capitalists will but turn their means in that direction. We ought to be the great market of the state for all those articles now supplied by Boston and New York; and in fact we are rapidly tending to that desirable point.

The report contains suggestions and arguments upon the general subject of home productions worthy of the most careful consideration of the people generally.

The reports were unanimously accepted. The stockholders made choice of the following gentlemen as Directors for the ensuing year: John A. Poor, George Warren, J. B. Cahoon, Chas. Jones, A. W. H. Clapp, Horace Felton, T. R. Jones.

The board is the same as last year with the exception of T. R. Jones, Esq., who takes the place of John Fox, Esq., who declined. Mr. Poor has since been re-elected President of the board.

We quote the following extracts from the report of the Directors above referred to:—

"It is a fact worthy of note, in speaking of the progress of this enterprise during the unusual pressure in the money market, that very few shares have been disposed of in the market, and few, if any, at a sacrifice.

And in this connection, we take pleasure in saying, that the Treasurer has been able to meet all the engagements of the company without any forced sale of stock, or the payment of a single dollar for extra interest.

The company have turned out from their works, 10 Locomotive Engines, 9 Passenger Cars, 3 Mail Cars, 22 Earth Cars, 30 Platform Cars, and 40 Box Freight Cars, and a steamboat and stationary Engine, and a large amount of work in various forms, including repairs for the Atlantic and St. Lawrence R. R. Co., castings, and other descriptions of manufacture.

The car department has turned out work to the amount of \$41,064 93—the Engine department, \$181,603 70. Besides these amounts, there have been turned out from the Foundry over 150 tons of chairs, and a large amount of other castings, not charged to either the Car or Engine department.

The permanent investments of the company have cost—

Real Estate, wharves and bridges....	\$12,628 29
Buildings.....	35 447 36
Tools.....	33,588 59

Total.....\$81,665 24

There have been expended during the past year, on

Real Estate,	\$1,185 74
Buildings,	2,369 99
Tools,	7,805 44

\$11,361 17

Taking into view the extent and favorable location of our real estate and buildings, and the approved pattern and workmanship of our tools, the Directors are of opinion that a more favorable investment for this branch of manufacture could not now be made; nor can any similar one more favorable be found in any part of the country. With a new Engine, soon to be put in operation, (now in progress in the shop) we shall have the means of executing readily orders for work, equal to any demand likely to occur for some time to come."

Some Engines from this shop recently passed through this city on their way to Ohio.

Horace Felton is Superintendent of this Company, and

James C. Churchill Treasurer, Agent and Clerk.

Michigan Southern Railroad.

The following gentlemen have been elected Directors of the Southern (Mich.) Railroad Co: George Bliss, Esq., of Springfield, Mass, President; Charles Noble of Monroe, Secretary; Joel Rathbone of Albany Treasurer; Elisha C. Litchfield of Detroit, Asst. Treasurer, and Charles Butler of Newburgh,

George Bliss of Springfield, Mass, John Stryker of Rome. N. Y.; Joel Rathbone of Albany, Edwin C. Litchfield of New York, were appointed Finance Committee, on whom were devolved the executive duties of the Board. Two parties of engineers have been engaged for several weeks in surveying the road for its extensions west-ward, one between Hillsdale and Coldwater, and the other in Indiana. Arrangements were made at the same time looking to the extension of the road to the pier at the Lake of Monroe.

Engine and Car Works, PORTLAND, MAINE.

THE PORTLAND COMPANY, Incorporated August 8th, 1846, with a capital of \$250,000, have erected their extensive Works upon the deep water of Portland Harbor, and receive and transport, to and from their works direct, to and from vessels of any class.

They now manufacture to order, and deliver upon the Railroads running in each direction from the city, or on shipboard as wanted, Locomotive, Stationary, or Steam Boat Engines; Passenger, Mail, Freight, Earth and Hand Cars; Railway Frogs, Switches, Chairs and Castings; and every other description of Machinery.

HORACE FELTON,
Superintendent.

JAMES C. CHURCHILL,
General Agent and Clerk.

Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO.,
No. 24 Commercial St. Boston.

August, 16, 1849.

6m33

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

1y33

Extension of the Baltimore and Ohio Railroad.

Proposals are invited for the Graduation and Masonry of the part of this road not already under contract between Cumberland and the Tygart's Valley river—a distance of about 103 miles. The number of sections now to be let will be about 58; of which 23 occur between Cumberland and the mouth of Savage River—18 in the glades, and the remainder on Raccoon and Three Forks creeks. The work will generally be moderate, although there are a number of sections worth the attention of contractors accustomed to heavy jobs.

Specifications and plans will be ready at Cumberland, on and after the 27 of August current. The proposals, addressed to the undersigned, will be received at Cumberland up to Saturday the 15 of September inclusive. Further information may be had at the Company's Office in Cumberland. Full testimonials will be required from those unknown to the undersigned.

By order of the president and directors.

BENJ. H. LATROBE, Chief Engineer.

August 9, 1848.

For Sale.

TURN TABLE, thirty feet in diameter, made by Aldrich of Worcester, nearly new, and in good order, will be sold at a low price, enquire of

JONA. EDWARDS, President.

Troy and Green bush Railroad,
Troy, New York.

July 28, 1849.

To Contractors.

BLUE Ridge railroad.—Proposals will be received by the undersigned at his Office in Brooksville, Albermarle county, Va., until the 1st of October next, for the construction of the tunnel through the Blue Ridge, together with the deep cut and embankment connected therewith at each end.

The tunnel will be 4,260 feet long, 16 feet wide and 20 feet high, with a ditch on each side: it will slope eastwardly at the rate of 66 ft. to the mile, and pass 700 feet below the top of the mountain.

Proposals will be received either for the whole or for one-half, it being distinctly stated, in this case, whether the Eastern or Western half is bid for.

Proposers are requested to examine the localities before bidding, and will obtain from the undersigned all necessary information.

The payments will be CASH, with a suitable reservation till the completion of the contract. The best testimonials and an energetic prosecution of the work will be expected.

Printed forms of proposals will be furnished on application to the undersigned.

By order of the President and Directors,

C. CROZET,

Engineer Blue Ridge Railroad.

Brooksville, July 26, 1849.

Samuel Kimber & Co., COMMISSION MERCHANTS

WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

To Contractors.

SEALED PROPOSALS will be received at the office of the James River and Kanawha Company in Richmond, until the 20th day of August next, for the construction of the connection of the Company's Canal with the tide water of James River at Richmond, from the Basin along the line of the old locks, and through the Richmond dock. This work will consist of five locks of 13-8-10 feet lift, with short intermediate basins, such culverts, walls, wastes, street bridges, &c, as shall be necessary; the raising of the walls and embankment of the present Dock; the extension of the Dock a few hundred feet eastwardly; and the construction of an outlet lock at the lower end thereof, capable of admitting the largest vessels coming to the port of Richmond.

Sealed proposals will also be received at the same time and place, until the same date, for the construction of the following works:

1. For the construction of the connection of the Company's canal with the Rivanna river at Columbia. This work will consist of a canal four and a half miles long, a timber dam across the Rivanna river at Stillman's Mills, a stone guard-lock, and several culverts.

2. For the construction of the connection of the Company's canal with the James River at Cartersville.—This work will consist of a timber dam across James river, the excavation of a basin at Pemberton, and a canal from Pemberton to James river 1000 feet long, with a lock of 15 feet lift.

3. For the construction of the connection of the Company's canal with the James river Near new Canton.—This work will consist of a timber dam across James river, the excavation of a canal 1200 feet long, and a lock of 6 feet lift.

4. A wooden bridge across James river at Hardwicksville 724 feet long, supported by stone piers about 140 feet apart.

5. A wooden bridge across James river at Bent Creek 870 feet long, supported by stone piers about 140 feet apart.

This work will be paid for in current bank notes. Besides the usual reservation of 20 per cent. on the monthly estimates, the contractor or contractors will be required to give ample security, satisfactory to the board of Directors, for the completion of the work at the time and in the manner specified in the contracts.

Plans of the above work will be exhibited, and specifications thereof delivered to the contractors, at the Company's office in Richmond, by the 5th day of August next, on application to Mr. E. H. Gall, the Engineer in charge of the tide water connection and Mr. John Cooty, the engineer in charge of the other works above enumerated. After the receipt of the proposals, time will be taken for the consideration thereof until the 23d of the same month, on which day, in case the proposals should be found satisfactory, the several jobs, as above advertised, will be let.

WALTER GWYNN,

Chief Engineer J. R. & K. Co.

Richmond, July 18, 1849.

3129

Journal of the Franklin Institute of the State of Pennsylvania, for the Promotion of the Mechanic Arts.

The oldest Mechanical Periodical extant in America, is published on the first of each month in the City of Philadelphia. It has been regularly issued for upwards of twenty-three years, and is carefully edited by a committee of scientific gentlemen appointed for the purpose, by the Franklin Institute.

The deservedly high reputation, both at home and abroad, which this Journal has acquired and sustained, has given it a circulation and exchange list of the best character, which enables the Committee on Publications to make the best selection from foreign Journals and to give circulation to original communications on mechanical and scientific subjects, and notices of new inventions; notices of all the Patents issued at the Patent Office, Washington City, are published in the Journal, together with a large amount of information on Mechanics, Chemistry, and Civil Engineering, derived from the latest and best authorities.

This Journal is published on the first of each month, each number containing at least seventy-two pages, and forms two volumes annually of about 432 pages each, illustrated with engravings on copper and on wood of those subjects which require them.

The subscription price is Five Dollars per annum, payable on the completion of the sixth number; and it will be forwarded free of postage when five dollars are remitted to the Actuary (postage paid) in advance for one year's subscription.

Communications and letters on business must be directed to "the Actuary of the Franklin Institute, Philadelphia, Pennsylvania," the postage paid.

WILLIAM HAMILTON,
Actuary, F. I.

Patents for Inventions.

THE Subscriber offers his services for the procurement of Patents in the UNITED STATES; in the CANADAS and other British Colonial possessions; in the SPANISH, FRENCH and other WEST INDIES.

ALSO IN EUROPE.

ENGLAND WITH COLONIES; SCOTLAND and IRELAND. FRANCE, BELGIUM HOLLAND, etc.

The foreign patents are procured through special agents, established by, and solely responsible to this establishment. At this office may be obtained all documents required in patent business; *Deeds, Conveyances, Agreements, Assignments, etc.* Counsel given on questions involving points of law in Contested Cases, and written opinions, on the title claims, etc., where the validity of a Patent is questioned.

MECHANICAL ENGINEERING DEPARTMENT.

Drawings of all kinds furnished to parties who wish to prosecute their own patent business. Accurate working drawings for Pattern Makers or for making Contracts with Manufacturers; calculations and drawings made, for constructing difficult and complicated machines or parts of machines. Draughtsmen furnished to take Drawings of Mills, Mill Sites, and Machinery, in any part of the country.

Pamphlets, containing full information on the above subjects, furnished gratis.

JOSEPH P. PIRSSON, Civil Engineer,
Office, No. 5 Wall St.

Steam Boiler Explosions.

THE Subscriber having been appointed sole Agent for Faber's Magnetic Water Gauge, is now ready to supply the trade, and also individuals with this celebrated instrument. Besides the greatest safety from explosion resulting from its use, it is a thorough check against careless stoking and feeding. In marine engines it will regulate the exact quantity required in the "blow off." Pamphlets containing full information, can be had free on application to the Agent,

JOSEPH P. PIRSSON,
Civil Engineer, 5 Wall st.

Situation Wanted,

AS an Engineer on a Canal or Railroad, by a gentleman from Germany, who is familiar with the English and French languages, and who has for seven years been engaged in the study and practice of Engineering and the Superintendence of Public Works. Address

LEWIS BURYER,
64 Avenue B, New York.

ENGINEERS.

Arrowsmith, A. T.,

Buckfield Branch Railroad, Buckfield, Me.

Baneks, C. W.,

Engineer's Office, Southern Railroad, Jackson, Miss.

Berrien, John M.,

Michigan Central Railroad, Marshall, Mich.

Clement, Wm. H.,

Little Miami Railroad, Cincinnati, Ohio.

Fisk, Charles B.,

Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,

Fitchburgh Railroad, Boston, Mass.

Floyd-Jones, Charles,

South Oyster Bay, L. I.

Ford, James K.,

New York.

Gzowski, Mr.,

St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,

Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,

Nashville and Chattanooga R. R., Nashville, Tenn.

Harry, P.,

Binghamton, New York.

Holcomb, F. P.

Southwestern Railroad, Macon, Ga.

Higgins, B.

Mansfield and Sandusky Railroad, Sandusky City, O.

Johnson, Edwin F.

New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,

Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,

Worcester and Nashua Railroad, Worcester, Mass.

Morton, A. C.,

Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,

South Carolina Railroad, Charleston, S. C.

Nott, Samuel,

Lawrence and Manchester Railroad, Boston,

Reynolds, L. O.,

Central Railroad, Savannah, Ga.

Roberts, Solomon W.,

Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Robinson, James P.,

Androscoggin & Kennebec Railroad, Waterville, Me.

Schlatter, Charles L.,

Northern Railroad (Ogdensburg), Malone, N. Y.

Stark, George.,

Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,

Pottstown, Pa.

Trimble, Isaac R.,

Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,

United States Fort, Bucksport, Me.

Thomson, J. Edgar.,

Pennsylvania (Central) Railroad, Philadelphia.

Whipple, S.,

Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,

Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,

Milwaukee, Wisconsin.

BUSINESS CARDS.

To Railroad & Navigation Cos.

Mr. M. BUTT HEWSON, *Civil Engineer*, offers his services to Companies about to carry out the surveys or works of a line of Navigation or Railroad. He can give satisfactory references in New York City as to his professional qualifications; and will therefore merely refer here to the fact of his having been engaged for upwards of two years conducting important Public Works for the British Government.

Communications will find Mr. Hewson at the office of the Railroad Journal, 54 Wall Street, New York.

J. T. Hodge,

NO. 1 NEW STREET, NEW YORK.

James Laurie, Civil Engineer,

No. 23 RAILROAD EXCHANGE, BOSTON, MASS.

Railroad Routes explored and surveyed. Estimates, Plans and Specifications furnished for Dams, Bridges, Wharves, and all Engineering Structures.

October 14, 1848.

6m*

James Herron, Civil Engineer,

OF THE UNITED STATES NAVY YARD,

PENSACOLA, FLORIDA.,

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

Dudley B. Fuller & Co.,

IRON COMMISSION MERCHANTS,

No. 139 GREENWICH STREET,
NEW YORK.

Cruse & Burke,

Civil Engineers, Architects and Surveyors,

Office, New York State Institution of Civil Engineers,

STATE HALL, ALBANY., N. Y.

Drawings, specifications and surveys accurately executed. Pupils instructed theoretically and practically at a moderate premium.

May 26, 1849.

To Railroad Companies.

—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK,

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.

May 16, 1849.

Manning & Lee,

GENERAL COMMISSION MERCHANTS,

NO. 51 EXCHANGE PLACE,

BALTIMORE.

Agents for Avalon Railroad Iron and Nail Works, Maryland Mining Company's Cumberland Coal 'CED'—'Potomac' and other good brands of Pig Iron.

IRON.

THE NEW JERSEY IRON CO'S WORKS AT

Boonton, are now in full operation, and can execute orders for Railroad Bars of any required pattern, equal in quality to any made in this country. Apply to

J. F. MACKIE,

Nos. 85 and 87 Broad St.

New York, June 8, 1849.

Railroad Iron.

OF approved T patterns, weighing 56 to 60 lbs. per lineal yard, made by the best English manufacturers, and under our own specification and inspection.

In store and to arrive. For sale by

DAVIS, BROOKS, & CO.,

68 Broad street.

New York, June 1, 1849.

The above will favorably compare with any other rails.

Railroad Iron, Pig Iron, &c.

600 Tons of T Rail 60 lbs. per yard.

35 Tons of 2½ by 4 Flat Bars.

25 Tons of 2½ by 9-16 Flat Bars.

100 Tons No. 1 Gartscherrie.

100 Tons Welsh Forge Pigs.

For Sale by A. & G. RALSTON & CO.

No. 4 So. Front St., Philadelphia.

Monument Foundry.
A. & W. DENMEAD & SON,
 Corner of North and Monument Sts.,—Baltimore,
 HAVING THEIR
IRON FOUNDRY AND MACHINE SHOP
 In complete operation, are prepared to execute
 faithfully and promptly, orders for
 Locomotive or Stationary Steam Engines,
 Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw
 Mills,
 Slide, Hand or Chuck Lathes,
 Machinery for cutting all kinds of Gearing.
 Hydraulic, Tobacco and other Presses,
 Car and Locomotive patent Ring Wheels, war-
 ranted,
 Bridge and Mill Castings of every description,
 Gas and Water Pipes of all sizes, warranted,
 Railroad Wheels with best fagotted axle, fur-
 nished and fitted up for use, complete
 Being provided with Heavy Lathes for Bor-
 ing and Turning Screws, Cylinders, etc., we can
 furnish them of any pitch, length or pattern.
 Old Machinery Renewed or Separated—and
 Estimates for Work in any part of the United States
 furnished at short notice.
 June 8, 1849.

Railroad Iron.
THE TRENTON IRON COMPANY ARE NOW
 turning out one thousand tons of rails per month,
 at their works at Trenton, N. J. They are prepared to
 enter into contract to furnish rails of any pattern, and
 of the very best quality, made exclusively from the fa-
 mous Andover iron. The position of the works on the
 Delaware river, the Delaware and Raritan canal, and
 the Camden and Amboy railroad, enables them to ship
 rails at all seasons of the year. Apply to
COOPER & HEWITT, Agents.
 17 Burling Slip, New York.
 October 30, 1848.

American Cast Steel.
THE ADIRONDAC STEEL MANUFAC-
TURING CO. is now producing, from Ame-
 rican iron, at their works at Jersey City, N.J., Cast
 Steel of extraordinary quality, and is prepared to
 supply orders for the same at prices below that of
 the imported article of like quality. Consumers
 will find it to their interest to give this a trial. Or-
 ders for all sizes of hammered cast steel, directed as
 above, will meet with prompt attention.
 May 28, 1849.

SPRING STEEL FOR LOCOMOTIVES, TEN-
DEKERS AND CARS.—The subscriber is engaged
 in manufacturing spring steel from 1½ to 6 inches in
 width, and of any thickness required: large quantities
 are yearly furnished for railroad purposes, and wher-
 ever used its quality has been approved of. The estab-
 lishment being large, can execute orders with great
 promptitude, at reasonable prices, and the quality war-
 ranted. Address **J. F. WINSLOW, Agent,**
 Albany Iron and Nail Works.

Pig and Bloom Iron.
THE Subscribers are Agents for the sale of numer-
 ous brands of Charcoal and Anthracite Pig Iron,
 suitable for Machinery, Railroad Wheels, Chains, Hol-
 lowware, etc. Also several brands of the best Pud-
 dling Iron, Juniata Blooms suitable for Wire, Boiler
 Plate, Axe Iron, Shovels, etc. The attention of those
 engaged in the manufacture of Iron is solicited by
A. WRIGHT & NEPHEW,
 Vine Street Wharf, Philadelphia.

Railroad Iron.
RAILROAD IRON & LOCOMOTIVE TIRES
 imported to order, and constantly on hand, by
A. & G. RALSTON,
 4 South Front St., Philadelphia.

Railroad Iron.
THE MOUNT SAVAGE IRON WORKS, AL-
 leghany county, Maryland, having recently pass-
 ed into the hands of new proprietors, are now prepar-
 ed, with increased facilities, to execute orders for any
 of the various patterns of Railroad Iron. Communi-
 cations addressed to either of the subscribers will have
 prompt attention. **J. F. WINSLOW, President**
 Troy, N.Y.
ERASTUS CORNING, Albany.
WARREN DELANO, Jr., N.Y.
JOHN M. FORBES, Boston.
ENOCH PRATT, Baltimore, Md.
 November 6, 1849.

WILLIAM JESSOP & SONS'
CELEBRATED CAST-STEEL.
 The subscribers have on hand, and are constantly re-
 ceiving from their manufactory,
PARK WORKS, SHEFFIELD,
 Double Refined Cast Steel—square, flat and octagon.
 Best warranted Cast Steel—square, flat and octagon.
 Best double and single Shear Steel—warranted.
 Machinery Steel—round.
 Best and 2d gy. Sheet Steel—for saws and other pur-
 poses.
 German Steel—flat and square, "W. I. & S." "Eagle"
 and "Goat" stamps.
 Genuine "Sykes," L. Blister Steel.
 Best English Blister Steel, etc., etc., etc.
 All of which are offered for sale on the most favora-
 ble terms by **WM. JESSOP & SONS,**
 91 John street, New York.
 Also by their Agents—
 Curtus & Hand, 47 Commerce street, Philadelphia.
 Alex'r Fullerton & Co., 119 Milk street, Boston.
 Stickney & Beatty, South Charles street, Baltimore.
 May 6, 1848.

Railroad Iron.
100 Tons 2½ x ½, **30** Tons Railroad.
 All fit to re-lay. For sale cheap by
PETTEE & MANN,
 228 South St., New York.
 May 16, 1849.

MANUFACTURE OF PATENT WIRE ROPE
 and Cables for Inclined Planes, Standing Ship
 Riggers, Mines, Cranes, Tillers, etc, by
JOHN A. ROEBLING, Civil Engineer,
 Pittsburgh, Pa.
 These Ropes are now in successful operation on the
 planes of the Portage railroad in Pennsylvania, on the
 Public Slips, on Ferries, and in Mines. The first rope
 put upon Plane No. 3, Portage railroad, has now run
 four seasons, and is still in good condition.

Iron.
 THE Works of the New Jersey Iron Company at
 Boonton, N. J., having been recently enlarged and put
 in good repair, the company are prepared to receive
 orders for Iron, which will be executed with dispatch;
 and they warrant their iron equal in quality and finish
 to any in this country.
 ½ Round and square, to 6 inches,
 ½ Flat " " " " " "
 Ovals, half-ovals and half-round.
 Hoop, band and scroll iron.
 Nail plates, superior charcoal Horse shoe,
 Iron, sheet and Boiler iron,
 Tire iron for locomotives,
 Railroad spikes.
 Pig iron of superior quality for chilling.
 do, for foundry purposes.
 For sale by **JOHN F. MACKIE,**
 85 & 87 Broad Street,
 Sole agent for the New Jersey Iron Co,
 June 9, 1849.

Railroad Iron.
THE UNDERSIGNED ARE PREPARED TO
 contract for the delivery of English Railroad Iron
 of favorite brands, during the Spring. They also re-
 ceive orders for the importation of Pig, Bar, Sheet, etc.
 Iron. **THOMAS B. SANDS & CO.,**
 22 South William street,
 New York.
 February 3, 1849.

Railroad Iron.
THE SUBSCRIBERS ARE PREPARED TO
 take orders for Railroad Iron to be made at their
 Phoenix Iron Works, situated on the Schuylkill Riv-
 er, near this city, and at their Safe Harbor Iron Works,
 situated in Lancaster County, on the Susquehanna
 river; which two establishments are now turning out
 upwards of 1800 tons of finished rails per month.
 Companies desirous of contracting will be promptly
 supplied with rails of any required pattern, and of the
 very best quality.
REEVES, BUCK & CO.,
 45 North Water St., Philadelphia.
 March 15, 1849.

Railroad Iron.
THE Undersigned offer for sale 3000 Tons Railroad
 Iron at a fixed price, to be made of any required
 ordinary section, and of approved stamp.
 They are generally prepared to contract for the de-
 livery of Railroad Iron, Pig, Bar and Sheet Iron—or
 to take orders for the same—all of favorite brands, and
 on the usual terms. **ILLIUS & MAKIN,**
 41 Broad street.
 March 29, 1849. 3m.13

American Pig, Bloom and
Boiler Iron.
HENRY THOMPSON & SON,
 No 57 South Gay St., Baltimore, Md.,
 Offer for sale, *Hot Blast Charcoal Pig Iron* made at
 the *Catoctin* (Maryland), and *Taylor* (Virginia), *Fur-*
naces; *Cold Blast Charcoal Pig Iron* from the *Clover-*
dale and *Catawba*, Va., Furnaces, suitable for *Wheels*
 or *Machinery* requiring *extra strength*; also *Boiler*
 and *Flue Iron* from the mills of *Edge & Hilles* in *Del-*
aware, and *best quality Boiler Blooms* made from *Cold*
Blast Pig Iron at the *Shenandoah Works*, Va. The
 productions of the above establishments can always be
 had at the lowest market prices for approved paper.
 American Pig Iron of other brands, and *Rolled* and
Hammered Bar Iron furnished at lowest prices. A-
 gents for *Watson's Perth Amboy Fire Bricks*, and
 Rich & Cos. New York Salamander Iron Chests.
 Baltimore, June 14, 1849. 6 mos

Iron Wire.
REFINED IRON WIRE OF ALL KINDS,
 Card, Reed, Cotton-flyer, Annealed, Broom,
 Buckle, and Spring Wire. Also all kinds of Round,
 Flat or Oval Wire, best adapted to various machine
 purposes, annealed and tempered, straightened and
 cut any length, manufactured and sold by
ICHABOD WASHBURN.
 Worcester, Mass., May 25, 1849.

American and Foreign Iron.
FOR SALE,
 300 Tons A 1, Iron Dale Foundry Iron.
 100 " 1, " " " "
 100 " 2, " " " "
 100 " " Forge " "
 400 " Wilkesbarre " "
 100 " "Roaring Run" Foundry Iron.
 300 " Fort " "
 50 " Catoctin " "
 250 " Chikiswalungo " "
 50 " "Columbia" "chilling" iron, a very su-
 perior article for car wheels.
 75 " "Columbia" refined boiler blooms.
 30 " 1 x ½ Slit iron.
 50 " Best Penna. boiler iron.
 50 " "Puddled" " "
 50 " Bagnall & Sons refined bar iron.
 50 " Common bar iron.
 Locomotive and other boiler iron furnished to order.
GOODHUE & CO.,
 64 South street.
 New York.

PATENT HAMMERED RAILROAD, SHIP &
BOAT SPIKES.—The Albany Iron Works
 have always on hand, of their own manufacture, a
 large assortment of Railroad, Ship and Boat Spikes
 from 2 to 12 inches in length, and of any form of head
 From the excellence of the material always used in
 their manufacture, and their very general use for rail
 roads and other purposes in this country, the manu-
 facturers have no hesitation in warranting them fully
 equal to the best spikes in market, both as to quality
 and appearance. All orders addressed to the subscrib-
 ers at the works will be promptly executed.
JOHN F. WINSLOW, Agent.
 Albany Iron and Nail Works, Troy, N. Y.
 The above Spikes may be had at factory prices, of
 Erastus Corning & Co Albany; Menitt & Co., New
 York; E. Pratt & Bro, Baltimore Md

LAP—WELDED
WROUGHT IRON TUBES
 FOR
TUBULAR BOILERS,
 FROM 1 1-2 TO 8 INCHES DIAMETER.
 These are the ONLY Tubes of the same quality
 and manufacture as those so extensively used in
 England, Scotland, France and Germany, for Lo-
 comotive, Marine and other Steam Engine Boilers
THOMAS PROSSER,
 Patentee.
 28 Platt street, New York.

Roman Cement,
 OF the best quality, now landing from ship Hendrick
 Hudson, from London, made by Billingsley, Mial
 & Co., and superior to anything of the kind manufac-
 tured in England. For sale by **G. T. SNOW,**
 109 Water Street, New York.

Large Wooden Pumps.

SEVERAL Large Wooden Square Pumps, of various sizes from 6 to 24 inches, and lengths from 10 to 25 feet, strongly bolted and strapped together with wrought iron; and used to great advantage on the Boston Water works; also two screw pumps each 25 feet long and 2½ feet in diameter, are now for sale by the Boston Water Commissioners.

For further particulars inquire at No. 119 Washington Street, Boston, or of E. S. CHESBROUGH, West Newton.

June 8, 1849.

**P. S. DEVLAN & CO's
Patent Lubricating Oil.**

THE Subscribers invite the attention of Railroads, Steamboats, Machinists, etc., to the above article of Oil; they are prepared to supply it in any quantity. Certificates of its superiority over all other oils, from several of the largest Works and Railroads, can be seen at our office.

KENNEDY & GELSTON,

5½ Pine street, New York,

Sole Agents for the New England States and State of New York. 1y14

TO RAILROAD COMPANIES AND MANUFACTURERS of Railroad Machinery. The subscribers have for sale American and English Bar Iron, of all sizes; English Blister, Cast, Shear and Spring Steel; Juniata Rods; Car Axles, made of double refined iron; Sheet and Boiler Iron, cut to pattern; Tires for Locomotive Engines, and other railroad carriage wheels, made from common and double refined B. O. Iron; the latter a very superior article. The Tires are made by Messrs. Baldwin and Whitney, Locomotive Engine Manufacturers of this city. Orders addressed to them, or to us, will be promptly executed.

When the exact diameter of the wheel is stated in the order, a fit to those wheels is guaranteed, saving to the purchaser the expense of turning them out inside.

THOMAS & EDMUND GEORGE,

a45 N. E. cor. 12th and Market sts., Philad., Pa.

**To Railroad Companies and
Contractors.**

FOR SALE.—Two Locomotive Engines and Tenders, at present in use on the Beaver Meadow Railroad, being too light for their coal trains, but well calculated for either gravel or light passenger trains.

They weigh, in running order, about 8 tons each—having one pair of driving wheels 4 feet diameter, 4 truck wheels 30 inches diameter, with cylinders 10 in. diameter, and 18 inches stroke of piston. Tenders on 4 wheels. Address JAMES ROWLAND,

Prest. Beaver Meadow Railroad & Coal Co., Philadelphia.

or, L. CHAMBERLAIN, Sec'y,

at Beaver Meadow, Pa.

May 19, 1849.

India-rubber for Railroad Cos.

RUBBER SPRINGS—*Bearing and Buffer—Fuller's Patent—Hose* from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyler & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

HORACE H. DAY,

Warehouse 23 Courtlandt street.

New York, May 21, 1849.

NICOLL'S PATENT SAFETY SWITCH FOR Railroad Turnouts. This invention for some time in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design. It acts independently of the main track rails; being laid down or removed without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two castings and two rails; the latter, even if much worn or used, not objectionable.

Working models of the Safety Switch may be seen at Messrs. Davenport, Bridges & Kirk's Cambridge Port, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained, on application to the Subscriber, Inventor and Patentee.

G. A. NICOLLS,
Reading, Pa.

Large Pumps.

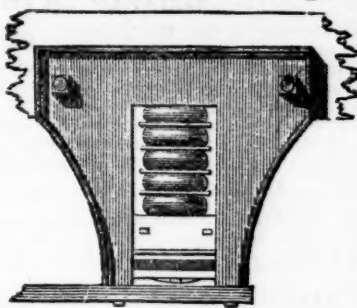
THE Boston Water Commissioners offer for sale a large number and variety of Wooden Square Pumps, used in clearing excavations from water during the construction of the Aqueducts.

Also Two Large Screw Pumps, each 25 feet long and 2½ feet in diameter.

For further particulars, enquire at the office of the Water Commissioners, 119 Washington St., Boston, or of E. S. Chesbrough, West Newton.

May 19, 1849.

6w20

Patent India-rubber Springs.

FULLER & CO. beg that parties interested in the use of these Springs will not be misled by exparte statements, but will examine the actual Patents and judge for themselves.

The statements made by Messrs. Crane & Ray shall be treated seriatim.

They claim to have first introduced India-rubber Springs about two years since, whereas they were used by Fuller & Co. nearly four years ago.

They claim the exclusive right to use Springs. They have no right whatever; every spring they make is an infringement upon Fuller's patent, dated 1845. They claim the sole right to make India rubber, and apparently think because a species of India-rubber was patented some years since, that no person can make any other now. A patent was granted in January last to Messrs. Tyler & Helm for a new and improved kind of Vulcanized rubber which is used by Fuller & Co.

Fuller's springs it is needless to say are in very general use, although Messrs. Crane & Ray pretend that they know of only one or two instances. Fuller & Co. guarantee all parties who use their springs.

As to the Legal proceedings—an action has been commenced against one company for an alleged infringement of Goodyear's patent, but is being defended with every prospect of success. An action has also been commenced by Fuller & Co., against parties for an infringement of Fuller's patent, and this will be done in every case of violation.

In every case in which Fuller's spring has been applied, it has been pronounced superior to that made by Mr. Ray, and this fact induces Messrs. Crane & Ray to claim the right of using it. They attempt to lead the public from the real question at issue, by producing a Deposition as to Mr. Ray having tried to make a spring which Mr. Fuller did make and patent. If Mr. Ray did invent a spring in 1844, why did he not apply for a patent, and not wait until 1848, when his application was rejected?

Mr. Kneivitt has never stated that the springs were put on by him, which are referred to in Mr. Hale's article, but he does state that those springs are made according to Mr. Fuller's specification, and consequently are an infringement upon it. The article of Mr. Hale in the Boston Advertiser, quoted by Messrs. Crane & Ray, was followed immediately by a letter in the same paper, from Mr. Kneivitt, setting forth the facts of the case.

The springs referred to were put on by Mr. Ray before Mr. Kneivitt came to the United States; when he arrived he gave Mr. Ray notice not to proceed further in making or vending such springs; Mr. Ray then said he did not wish to infringe, and would not continue to do so, and he then contrived an India-rubber and Air spring which totally failed.

In the selection of their first agent, Fuller & Co. were particularly unfortunate, and their reason for advertising to it is simply that it may tend to throw light on subsequent transactions, and furnish a reply to the remark, "that this opposition was invited by their own delay in getting the thing to work." The individual referred to undertook the agency for Fuller's springs, and left Liverpool on the 1st January, 1847, furnished with a complete set of drawings, models, etc., and every necessary instruction to make arrangements respecting the supply of material, and to have it at work within the time limited by law; but from that hour to the present, not a single communication has been received from the said agent. Some of their models,

however, they have traced into the hands of parties now seeking to invade their rights, and by whom they understand they have been exhibited as specimens of their own invention.

The superiority of Fuller's spring is implied in the offer of the New England Car Co. to make springs upon his principle (now that a preference is given to the disc and plate form) and this notwithstanding the fact, that Fuller & Co. have a patent, and that Mr. Ray's application for one was rejected. The public can judge which company's course has been the most honorable, or whose statements are entitled to consideration.

Fuller's springs can be obtained of Mr. Kneivitt the Agent, at 38 Broadway New York, and of Messrs. James Lee & Co., 13 India Wharf, Boston.

May 26, 1849.

C. W. Bentley & Co.,

IRON Founders, Portable Steam Engine Builders and Boiler Makers, Corner Front and Plowman Sts., near Baltimore St. Bridge,

BALTIMORE, MARYLAND.

Their Engines are simple in their construction, compact and durable; they require no brick work in setting them, and occupy but a small space (a six horse power engine and boiler, standing on a cast iron plate of three by six feet.)

They also manufacture Major W. P. Williamson's new oscillating Engine; a superior article, combining cheapness and simplicity (one of which may be seen in operation at their shop.) Both of these engines are adapted to any purpose, where power is required, and may be made of any capacity; and for economy in use of fuel are unsurpassed.

All kinds of machinery made to order. Steam Generators, Force Pumps, Wrought Iron Pipes and Fittings for Steam, Water, Gas, etc., constantly on hand, Baltimore, June 6, 1849.

PHILADELPHIA CAR MANUFACTORY,
CORNER SCHUYLKILL 2D AND HAMILTON STS.,
SPRING GARDEN, PHILADELPHIA CO., PA.

Kimball & Gorton,

Having recently constructed the above works, are prepared to construct at short notice all kinds of

RAILROAD CARS, Viz:

Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country.

Omnibuses from the Exchange run within one square of the manufactory every 10 minutes during the day. Philadelphia, June 16, 1849. 1y25

LAWRENCE'S ROSENDALE HYDRAULIC

Cement. This Cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms, and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by

JOHN W. LAWRENCE,

142 Front-street, New York.

Orders for the above will be received and promptly attended to at this office. 32 1y.

**Text Book of Mechanical
Drawing,**

FOR the use of SCHOOLS and SELF-INSTRUCTION, containing,

1st. A series of progressive practical problems in Geometry, with full explanations, couched in plain and simple terms; showing also the construction of the parallel ruler, plane scales and protractor.

2d. Examples for drawing plans, sections and elevations of Buildings and Machinery, the mode of drawing elevations from circular and polygonal plans, and the drawing of Roman and Grecian Mouldings.

3d. An introduction to Isometrical drawing, with 4 plates of examples.

4th. A treatise on Linear Perspective, with numerous examples and full explanations, rendering the study of the art easy and agreeable.

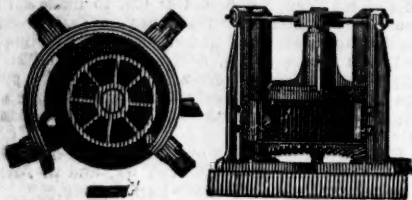
5th. Examples for the projection of shadows. The whole illustrated with 50 STEEL PLATES. Published by WM. MINIFIE & CO.,

114 Baltimore St., Baltimore, Md.

Price \$3, to be had of all the principal booksellers.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll rounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

RAILROAD WHEELS.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED, the Original Inventor of the Plate Wheel with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money.

A. TIERS,
Point Pleasant Foundry.

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country.

Kensington, Philadelphia Co.,
March 12, 1849.

A. T.

ENGINE AND CAR WORKS.

DAVENPORT & BRIDGES,

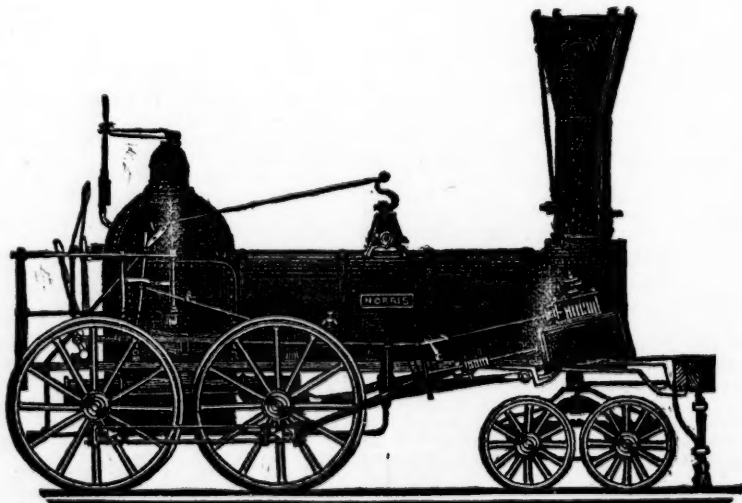
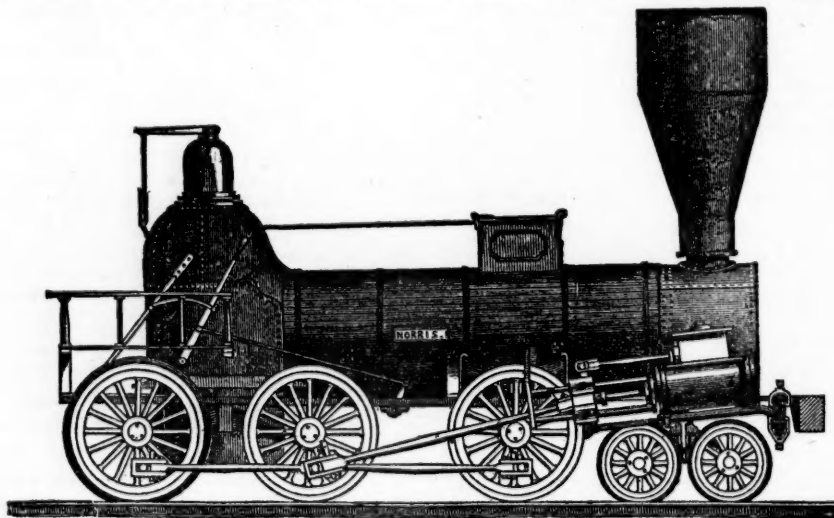
HAVING ASSOCIATED WITH THEM

MR. LEWIS KIRK, OF READING, PA.,

And recently enlarged their Establishment, (making it now the most extensive in the United States,) they are prepared to manufacture to order Locomotive Engines and Cars of every description. Stationary Engines, Steam Hammers, Boilers, and all kinds of Railroad Machinery. Also, Castings and Forge Irons of all kinds—including Chilled Wheels, Frogs, Chairs, Switches, Car Axles, and Locomotive Cranks, Connecting Rods, Steel Springs, Bolts, etc., etc. Orders from all parts of the country solicited for Engines and Cars, or any part or parts of the same. All orders will be furnished at short notice, and on as good terms as any manufactory in the country. Coaches pass our works every fifteen minutes during the day, from Brattle St., Boston.

DAVENPORT, BRIDGES & KIRK.

Cambridgeport, Mass., February 16th, 1849.

NORRIS' LOCOMOTIVE WORKS.
BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,

THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS.